Industrial Arts and Vocational Education

Vol. 42, No. 9

The Power Within

• All the material gains that are special to this age such as nuclear fission, electronics and coal chemistry have been achieved by looking deep within the constitution of matter.

So too with mankind, and it *does* matter who does the looking. Only as each sole man learns to look deep within himself, past mere pleasure and overweening pride, can he gain any notion of his true power, his true capabilities. And if he looks long enough he may even find within himself the answer to the vicious fears, dangers, vauntings and corruption that so characterize this moment of our civilization.

How get each person, especially each youngster who is now on his way to manhood, to look and to find the power? Certainly someone has to set the example, some older person, someone who has looked within and who makes a profession of so looking . . . the educator of our times.

The instructor in mechanical drafting is qualified on two counts. He knows the inner source of ideas, and he teaches in a field that puts a premium on such creative work, the values of which field are found only in man's inner core . . . the field of the engineer, the scientist and the creative craftsman. And so such instructor leads with care, stressing the world of inner values, of ambition, eagerness, zeal, achievement, discovery. Thus he leads the way up and he does not ever turn aside and undermine all he teaches by saying it does not matter what the quality of the tools the students use in their work.

Indeed these matter most of all for they are touchstones emanating cheapness or goodness according to how they are made. They are the coalescent point between the now and the hereafter. How then can they be less than fine, the maximum the student can afford?

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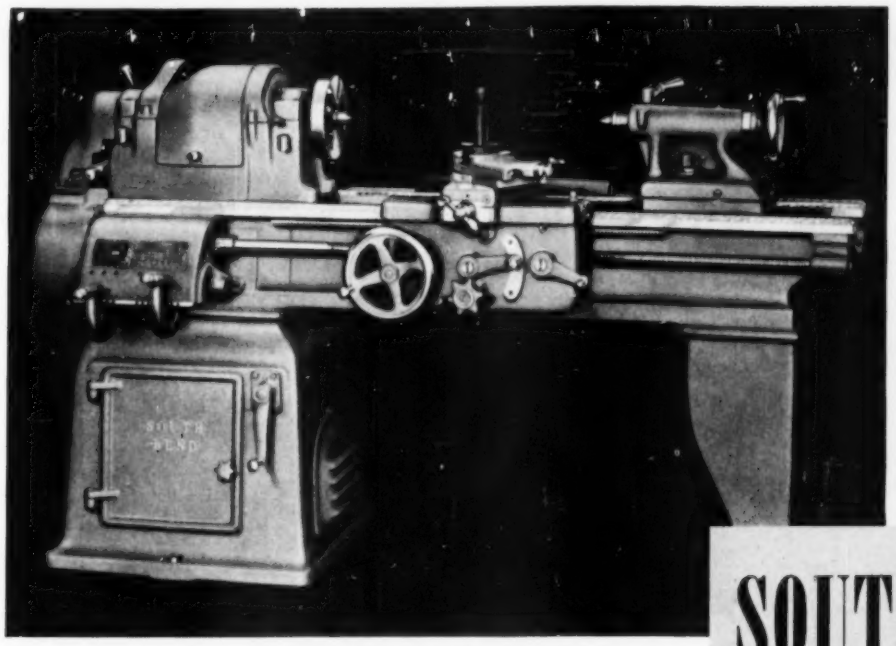

16" x 6' QUICK CHANGE GEAR LATHE

For Better Industrial Training

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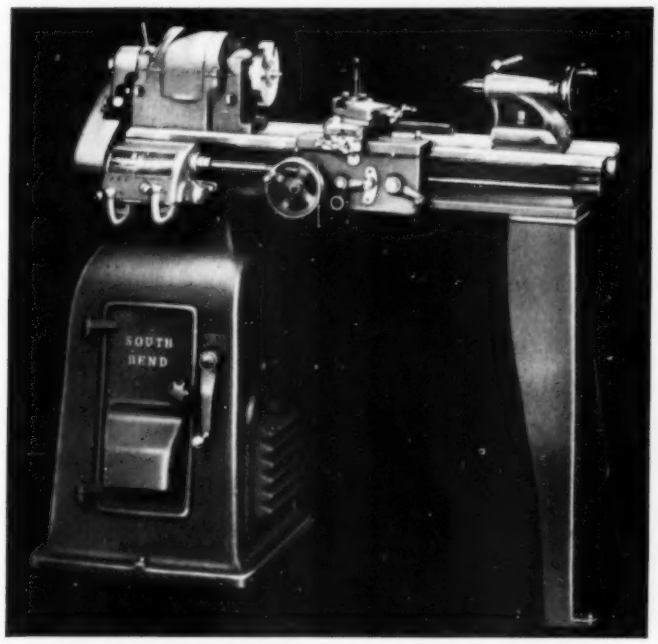

10" x 3½' QUICK CHANGE GEAR LATHE

Training for industry can be done better and easier on South Bend Lathes. Since machine handling is quickly mastered, more time is left for learning the different operations and less supervision is required.

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South Bend 22, Indiana

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1. See or telephone nearest distributor.
2. Order by mail from your distributor.
3. If no distributor is nearby, order direct from factory.

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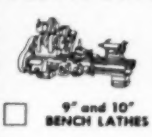
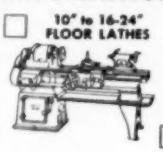
PLEASE SEND INFORMATION CHECKED:

☐ 9" and 10" BENCH LATHES

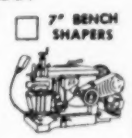


☐ 10" to 16-24" FLOOR LATHES



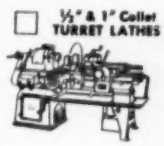
☐ DRILL PRESSES

☐ 7" BENCH SHAPERS



☐ TOOL GRINDERS

☐ ½" & 1" Collet TURRET LATHES



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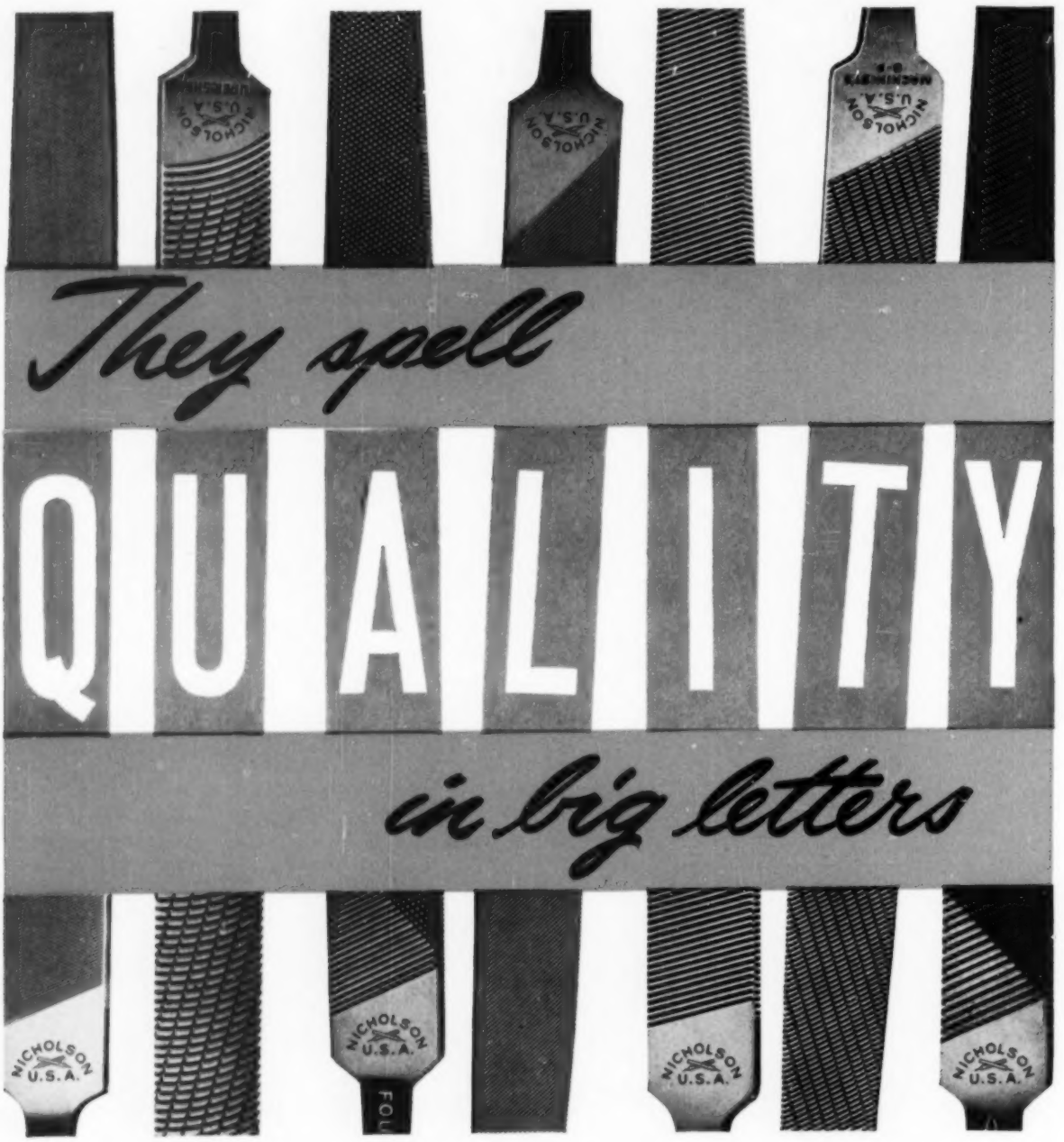

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NOVEMBER
1953

VOL. 42 NO. 9

INDUSTRIAL ARTS and VOCATIONAL EDUCATION

The Shop Teachers' Professional Magazine

Published on the 15th of the month preceding the date of issue by THE BRUCE PUBLISHING COMPANY, 400 North Broadway, Milwaukee 1, Wisconsin • CENTRAL OFFICE: 20 North Wacker Drive, Chicago 6, Illinois • EASTERN OFFICE: 225 Broadway, New York 7, New York.

This Month's Cover

This month's cover shows a student forming plastic with compressed air at Lake View High School, Chicago, Ill.

The photograph used for the cover picture was one of a series which Dr. Louis V. Newkirk, director, division of industrial arts of the Chicago public schools, submitted for illustrating his article, "Industrial Arts in Chicago."

Both Dr. Newkirk's article, and the news note in the association news column on page 4A, invite you to the coming AVA convention at the Hilton Hotel in Chicago.

Be sure to heed that invitation.

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Articles Indexed. — The articles contained in the Magazine are regularly indexed in "The Readers' Guide to Periodical Literature," and "Education Index."

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ASSOCIATION NEWS

COMING CONVENTIONS

Nov. 5. Iowa Vocational Association, at Hotel Savery, Des Moines, Iowa. Secretary, Mark Z. Hendren, State Office Bldg., Des Moines, Iowa.

Nov. 5. Wisconsin Industrial Arts Association, at Auditorium, Milwaukee, Wis. Secretary, Leo Ebben, High School, Kohler, Wis.

Nov. 6–7. Industrial Arts Association of Pennsylvania, at Penn Bedford Hotel, Bedford, Pa. President, J. Philip Young.

Nov. 6–7. New England Industrial Arts Teachers Association, at Stratfield Hotel, Bridgeport, Conn. Secretary, Arthur I. Martin, State Teachers College, Gorham, Me.

Nov. 12–14. Mississippi Valley Industrial Arts Conference, at LaSalle Hotel, Chicago, Ill. President, Verne C. Fryklund, The Stout Institute, Menomonie, Wis.

Nov. 23. American Technical Education Association, at Hilton Hotel, Chicago, Ill. Secretary, Frank J. Coyle, 32 Spring St., Springfield, Mass.

Nov. 23–27. American Vocational Association, at Conrad Hilton Hotel, Chicago, Ill. Secretary, Dr. M. D. Mobley, 1010 Vermont Ave., N.W., Washington 5, D. C.

THE 1953 AVA CONVENTION

The 1953 Convention of the American Vocational Association is scheduled to be held at Chicago, Ill., November 23 to 27.

This convention is expected to attract at least 5000 delegates from every part of the nation.

The 25-story Conrad Hilton Hotel will house all delegates, exhibits, and meetings. Vocational and industrial-arts educators throughout the state of Illinois are working together to insure a week of unprecedented professional help and good fellowship.

Harold E. Stassen will deliver one of the principal addresses at the AVA convention

Nationally prominent speakers slated to address general sessions include Harold E. Stassen, foreign operations administrator; Edward J. Condon, vice-president in charge of public relations, Sears-Roebuck and Company; Congressman Watkins Abbitt of Virginia; Mrs. John G. Lee, president, League of Women Voters of the U. S.; and Dr. Herold C. Hunt, professor of education, Harvard University, and former superintendent of schools, Chicago.

The Honorable William G. Stratton, Governor of the State of Illinois, will officially welcome the attendance.

AVA has broken another record in the early sellout of all space for commercial and educational exhibits. Customary half-day sessions will be set aside by each division for visits to the largest display in AVA Convention history.

The International Harvester Company, the Great Atlantic and Pacific Tea Company, and Sears-Roebuck will again play host to agricultural delegates at special affairs.

Louis V. Newkirk, director, division of industrial arts, Chicago board of education, is program chairman for industrial arts. This division will present a wide range of theory and craft programs for administrators, supervisors, teacher trainers, and shop teachers. All theory programs will include time for audience paticipation.

Craft demonstration programs will have special emphasis this year. Outstanding craftsmen from school and industry will offer a wide variety of practical demonstrations with tools and materials.

(Continued on page 6A)

There's Power to Spare

in these outstanding Millers Falls electric tools

In an electric tool, it's power that counts. And that's just what you get in these latest additions to Millers Falls power-packed utility line. Feature by feature — each is an eye-opener for value — designed and built to outperform any comparable tools on the market today.

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NEW ¼" PISTOL-GRIP DRILL

The biggest ¼" drill value ever offered. Light yet rugged, streamlined yet powerful. Also operates grinding, buffing and wire brush wheels, sanding discs and polishing bonnets.

No. 966
Sander-Polisher
MOST VERSATILE TOOL IN ITS FIELD

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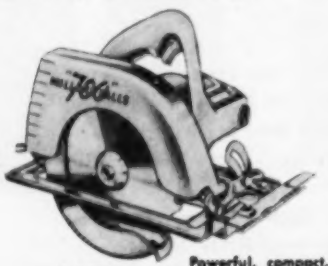

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6" JOINTER
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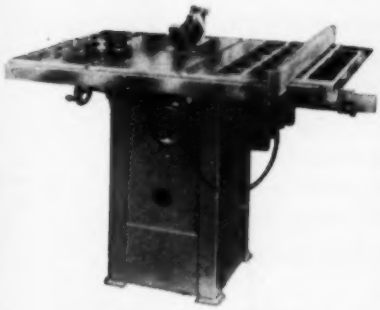

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ASSOCIATION NEWS

(Continued from page 4A)

W. M. Arnold, Oklahoma State Supervisor of Trade and Industrial Education, is program chairman for trade and industrial education. The theme of meetings for this group will be *The Improvement of Instruction*. Continued emphasis will spotlight labor-management-education relationships.

A series of interesting and informative sessions have been arranged by various industrial education associations. The National Association of State Supervisors of Trade and Industrial Education will devote a session to a presentation and discussion of The Ford Foundation Adult Education Program.

The National Association of Industrial Teacher Educators will have two outstanding meetings — *What America's Industries Need from Industrial Education*, and a symposium on co-operative plans for providing college credit for schools maintained by automotive manufacturers and equipment companies.

Groups and organizations that will meet during AVA Convention week: American Technical Education Association; National Council, Local Administrators of Vocational and Practical Arts Education; National Association of State Directors of Vocational Education; International Education, Special Meeting; *Agricultural Education* Magazine Editing-Managing Board; Delta Kappa Gamma; Iota Lambda Sigma; *School Shop* Editorial Advisory Board; *American Vocational Journal* Editorial Board; Academic Teachers in Vocational Schools; Officers of State Vocational Associations; The Ship; Safety Education, Special Meeting; National Association of State Supervisors of Distributive Education; National Association of State Supervisors of Home Economics Education; National Association of Industrial Teacher Educators; National Vocational Agricultural Teachers Association; National Association of Supervisors of Business Education; Distributive Education Clubs of America, Inc., Board of Trustees; Vocational Homemaking Teachers; National Association of Teacher Trainers of Home Economics; Industrial Arts Policy and Planning Committee; National Association of State Supervisors of Trade and Industrial Education; Women's Section — Trade and Industrial Education; National Association of Guidance Supervisors and Counselor Trainers (Central Regional Conference).

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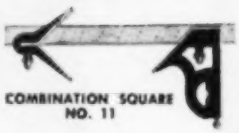

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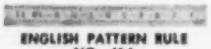

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THE AVA CONVENTION AT CHICAGO INDUSTRIAL-ARTS EDUCATION PROGRAM

The industrial-arts program will feature a wide range of theory and craft programs for administrators, supervisors, teacher trainers, and shop teachers. All theory programs will not only provide outstanding authorities to make the presentations but will allow time for audience participation.

Craft demonstration programs are being given special emphasis this year and the craft programs are being given equal billing as to time and place with the theory programs. Outstanding craftsmen from school and industry will give a wide variety of practical demonstrations with tools and materials.

Roy G. Fales, vice-president of industrial arts, A.V.A., and director, Bureau of Industrial Arts Education, Albany, N. Y., and Louis V. Newkirk, convention program chairman, A.V.A. Industrial Arts Section, and director, Division of Industrial Arts, Chicago Board of Education, Chicago, Ill., present the following outline of the major industrial-arts education meetings for the Chicago convention.

MONDAY, NOVEMBER 23

Visit Commercial Exhibits, 9:00 a.m.

Luncheon and Tour, Duro Metal Products and Logan Engineering Company, 11:00 a.m. to 4:00 p.m.

The number that can be accommodated on this tour is somewhat limited. Send your reservations immediately to Louis V. Newkirk, Program Chairman, Industrial Arts Education Section, A.V.A. Chicago Board of Education, 228 North LaSalle Street, Chicago 1, Ill., so that transportation and food can be reserved for you.

TUESDAY, NOVEMBER 24

National Conference of State and Local Supervisors of Industrial Arts, 9:00 to 11:00 a.m.

Chairman, Arthur F. Ahr, Supervisor, Bureau of Industrial Arts Education, State Education Department, Albany, N. Y.

National Conference of State and Local Supervisors of Industrial Arts, 2:00 to 4:00 p.m.

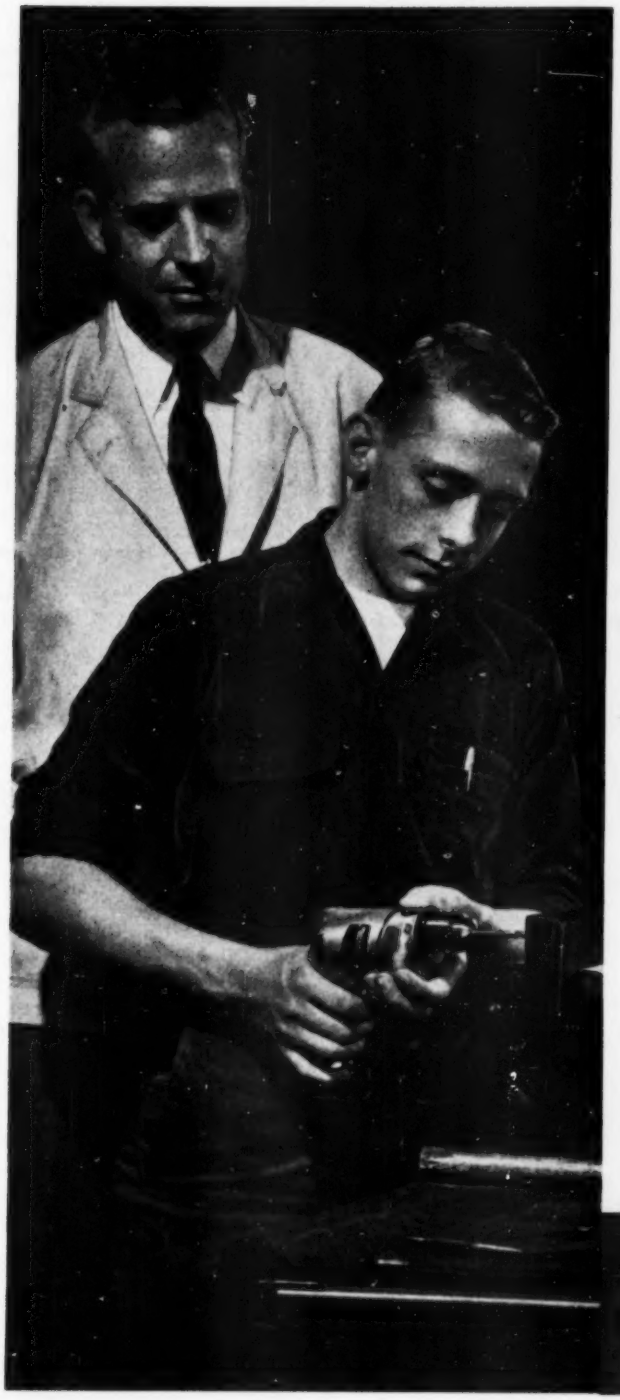
Chairman, G. Wesley Ketcham, State Supervisor of Industrial Arts, State Education Department, Hartford, Conn.

National Association of Industrial Teacher Educators, 2:30 p.m.

Chairman, E. W. Tischendorf, Head of Industrial Arts, Kent State University, Kent, Ohio.

(Continued on page 8A)

Black & Decker Power Makes Drilling



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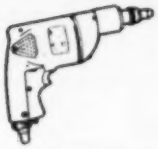


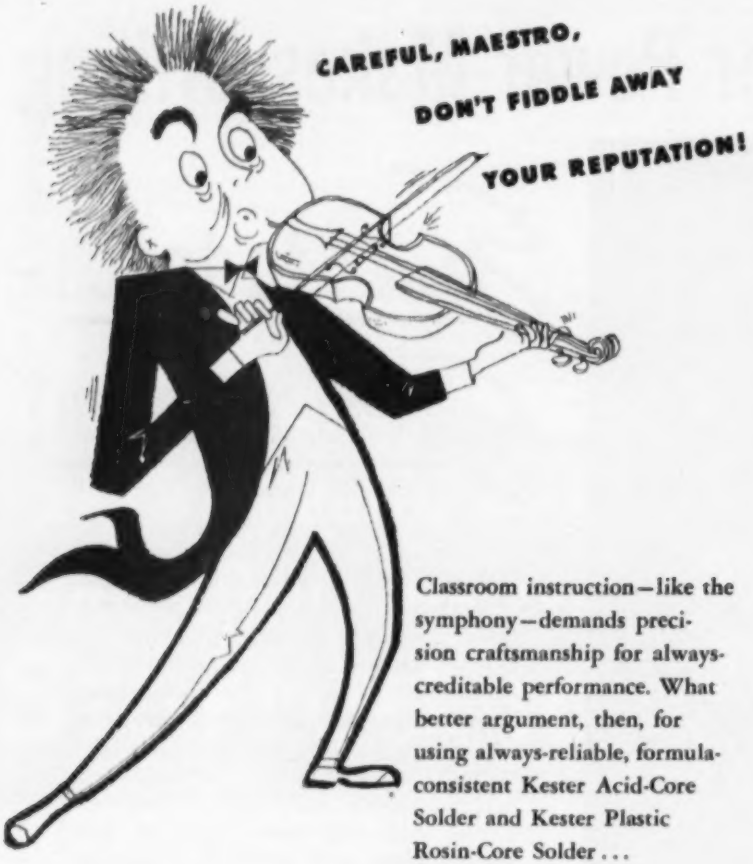
SCREW DRIVERS

DRILLS

BENCH GRINDERS

VALVE REFACERS

VALVE SEAT GRINDERS



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ASSOCIATION NEWS

(Continued from page 6A)

WEDNESDAY, NOVEMBER 25

Method in Teaching Industrial Arts Education, 9:00 to 11:00 a.m.
Chairman, Dr. Homer J. Smith, Head Industrial Education Department, University of Minn.
Plastic Crafts, 9:00 to 11:00 a.m.
Chairman, Raymond Cherry, Lockport, Ill.
Planning the Industrial Arts Education Shop, 2:00 to 4:00 p.m.
Chairman, V. L. Pickens, Division of Practical Arts, Kansas City, Mo.
Woodcrafts, 2:00 to 4:00 p.m.
Chairman, Roy A. Radtke, Director of Industrial Arts, Milwaukee, Wis.
The General Shop of the Future, 2:00 to 4:00 p.m.
Chairman, Professor George F. Henry, Head, Industrial Arts Education Department, Colorado A & M College, Fort Collins, Colo.

THURSDAY, NOVEMBER 26

Metalcrafts, 9:00 to 11:00 a.m.
Chairman, Dr. John L. Feirer, Head, Department of Industrial Arts Education, Western State College of Education, Kalamazoo, Mich.
Industrial Arts in 1960, 9:00 to 11:00 a.m.
Chairman, Frank C. Moore, Director of Industrial Arts, Board of Education, Cleveland, Ohio.
Finishing Craft Materials, 2:00 to 4:00 p.m.
Chairman, Dr. Lynne C. Monroe, Director of Industrial Arts, University of California, Santa Barbara, Calif.
Methods of Teaching the Industrial Arts, 2:00 to 4:00 p.m.
Chairman, Dr. Chris H. Groneman, Head, Industrial Education Department, Agriculture and Mechanical College of Texas, College Station, Tex.

The commercial exhibitors will be represented by the following officers of the SHIP at Chicago: *Captain,* Todd Jones, School Shop Magazine; *1st Mate,* John Guthrie, Weber Costello Co.; *2nd Mate,* R. C. Stucker, Hardwood Corp. of America; *Log Officer,* Wm. B. Jennison, School Arts Magazine; *Purser,* Harry E. Masters, L. S. Starrett Co.; *Radio Officer,* C. H. Clawson, Brodhead-Garrett Co.; *Steward,* Thomas C. Lineacre, E. H. Sheldon Co.

INDUSTRIAL ARTS ASSOCIATION OF PENNSYLVANIA

The first annual conference of the Industrial Arts Association of Pennsylvania will be held at the Penn Bedford Hotel, Bedford, Pa., on November 6 and 7, 1953.

The program will start on Friday, November 6, at 9:00 a.m., with the registration in the lobby of the Penn Bedford Hotel. Displays will be in the Club Room, first floor. Industrial tour through Kennemetal, Inc., and school visit, Bedford High School.

At the Friday 2:00 p.m. meeting, the theme, "Industrial Arts Interprets Industry," will be discussed.

Dr. S. L. Coover, director of industrial arts, State Teachers College, California, Pa., will preside.

The annual convention dinner will be held at 6:30 p.m.

Palmer M. Sharpless, head, industrial-arts department, George School, Bucks County, Pa., will be the toastmaster.

(Continued on page 20A)

teachers and students can **DO**
so much **MORE**
so much **BETTER**
with this

Cutter head guarded front and rear.

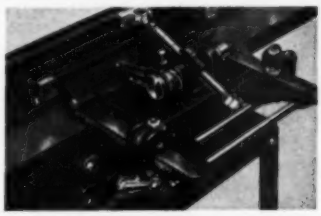
BIG Atlas 6" JOINTER-PLANER

THESE Atlas DESIGN FEATURES GIVE YOU —

- BIGGER CAPACITY
- MAXIMUM ACCURACY
- SMOOTHER FINISH

Cutter-head-spindle is machined from a solid bar of fine-grained steel, then precision ground — 2¾" in diameter, weighs 10 lbs. Cutter slots are milled to extremely close tolerance for fine precision work.

Cutter head can be quickly removed and the blades re-sharpened while right in the cutter head. This new feature is exclusive with Atlas. Blade-height adjustment screws permit quick, accurate positioning of cutter head and blades.



Fence positions easily — one movement of lever releases or anchors it in place for width of cut adjustment. Fence tilts 45° both ways — has positive, adjustable stops for 45° positions, index plunger for quick, vertical setting.

For school shop work no other jointer-planer compares with the 6" Atlas. Unprecedented ease of operation, safety, accuracy and smoothness of cut put it in a class by itself.

Soundly engineered and precision built, the Atlas is a massive machine designed to make easy work of the toughest jobs. The solid steel cutter-head-spindle alone weighs 10 lbs. The grey-iron tables are 42" overall and the 32" x 4½" fence is actually larger than many 6" jointer tables. *Both are precision ground to .005" tolerance.*

The rear table is stationary for permanent, accurate alignment with the front table and cutter head . . . this means greater accuracy and efficiency . . . less trouble for student and instructor. Rear table widens to 12" for ease of handling wide boards — fence and guard are easily removable. Front table widens 2" at cutter head for firm rabbeting support — has exclusive width-of-rabbet scale. Sealed-for-life ball bearings assure smooth, quiet operation, and years of service.

Before you select any new jointer-planer ask your Atlas dealer to show you all the important features that make the 6" Atlas the best buy on the market at any price. Write today for the latest Atlas woodworking tool catalog.

Send for the 18 Outdoor Equipment Woodworking Plan Book today. All new designs of useful outdoor furniture and other practical projects. Plans are complete and fully illustrated. Books are 50c each, postpaid, 65c outside U.S.A.

Atlas Press Company

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Your Students Will Learn FASTER on a PARKS PLANER

The PARKS No. 20
20" PLANER

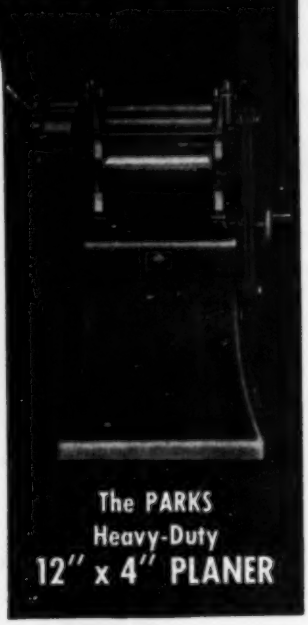
Students advance quickly on Parks-Planers because they find them easy to operate, safe, and accurate. And, since both the Parks 12" and Parks 20" Planers have been designed and precision-built for accuracy and high-speed line production in industry, they are ideally suited for the school shop because they give practical experience on the type of machines your students will eventually use. Both machines are priced low enough for even the most modest shop budget.

The Parks No. 20. 20" Planer has a 4-knife cutterhead with a speed of 3600 R. P. M. and offers two feed speeds—20 and 40 F. P. M., and 40 and 80 F. P. M. Will take work up to 20" wide by 6" thick. Ruggedly built for vibrationless operation.

The Parks Heavy-Duty 12" x 4" Planer. A compact, sturdy thickness planer that offers mill planer precision at low price. Has feed speed of 16 F. P. M. at 4000 R. P. M. Will handle material as short as 6" and as thin as 1/16".

Write for complete descriptive literature.

Manufacturers of Quality Woodworking Machines since 1887.



The PARKS
Heavy-Duty
12" x 4" PLANER

The PARKS WOODWORKING MACHINE CO., Dept. 24-B11, 1546 Knowlton St., Cincinnati 23, Ohio

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INDUSTRIAL BENCH AND EQUIPMENT MFG. CO. INCORPORATED

STUDENT BENCHES

built by America's foremost specialists in school shop equipment

Equipment:
4 Woodworking, quick action or continuous screw type vises mounted one on each corner. Semi-steel casting. Jaw size 4" x 7" — Jaw opening 9".

Construction:
Top securely joined to lockers by lag screws and angle irons.

4 STUDENT BENCH #SWB4

INDUSTRIAL'S Student Benches are ideal for every need — in the metal, electrical, mechanical, woodworking, carpentry or foundry shops.

Rigidly built to take a lot of rough treatment — a minimum of space. Made in all popular styles, sizes and locker combinations of heavy gauge steel. All working surfaces are clear of bolts, nuts, holes and sharp edges.

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Industrial Bench & Equipment Mfg. Co., Inc.
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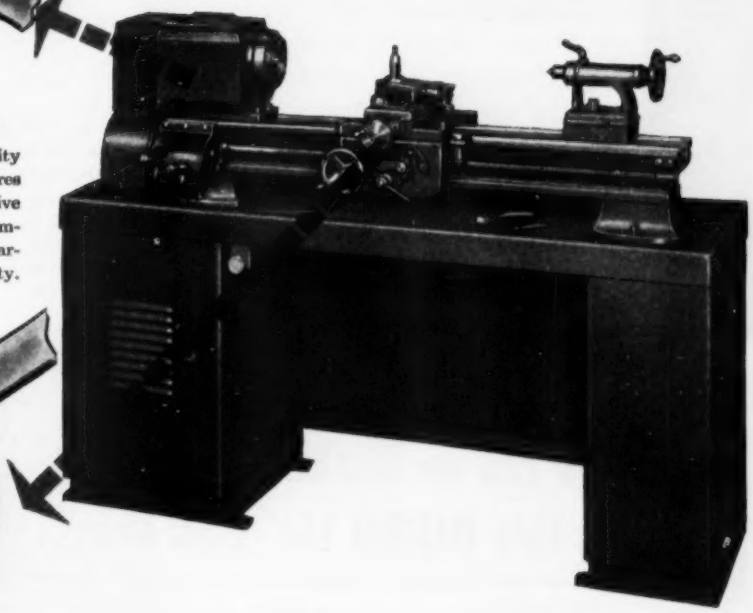
Benches — Steel, Maple Top, Welding, Machine Stands, Work Stands, Bench Legs, Tote Boxes.

Close-Up Look Tells Why... THE NEW 12" SWING LOGAN LATHE DELIVERS PLUS PERFORMANCE

For Production, Maintenance, Tool Room or School Shop



The HEADSTOCK Is Massive, Rigid, Convenient

Massively proportioned spindle means extreme rigidity on heavy cuts. Oversize ball bearing mounting assures sustained spindle accuracy. Outboard V-belt drive transmits power with maximum efficiency and simplifies belt changing or adjustment. Accessible gear-shift knobs add to operating convenience and safety.

The CARRIAGE Is Newest, Finest Construction

Simple, lever-operated disc type clutch gives new operating convenience. Easily read, widely separated graduations on the extra large dials permit accurate readings. Precision ground top surfaces on cross slide and saddle permit mounting fixtures and use of magnetic indicators. Extra wide and long bearing surfaces on cross feed slide. Heavy, massive compound for rigidity. Apron operates in bath of oil.

The closer you inspect this new 12" swing Logan Lathe, the *better* it looks. The advanced design of individual parts, and the precision construction throughout become more evident. You will like the size, too. Its 35" center distance, 1⅜" spindle hole, 1" collet capacity, and rugged, massive proportions mean extra capacity, stability and power. Keep this newest Logan in mind as you make plans for your production line, tool room, shop, or student training program. The quality you see in your close-up look will serve you well through extra years.

SEE IT AT YOUR LOGAN LATHE DEALER'S, OR

Write for Information...

Full catalog descriptions and price information on request. *Write today to*

Logan ENGINEERING CO.

LOOK TO LOGAN FOR BETTER LATHES AND SHAPERS

Brief Specifications of Logan 12" Lathes

Swing over bed and saddle wings, 12"... Center Distances, 23" and 35"... Turret Lathes Models have 43" bed length... 1⅜" spindle hole ... 1" collet capacity ... 16 spindle speeds, 38 to 1260 rpm.

QUICK CLAMPS SAVE TIME

Individually Power-Tested For Better Performance

- Can be applied QUICKLY, released QUICKLY.
- Adaptable to greater variety of work. Especially useful in pattern making, foundry work, metal work, boat and shipbuilding, automobile and aircraft production.
- Rigid at any opening — no side twisting or bending of screws.
- Clutches insure positive locking. . . . . .

WRITE FOR CATALOG: Showing A CLAMP FOR EVERY PURPOSE, openings from ½" to 12' and depths from 1/16" to 16". Also Chisels, Punches, Star Drills, Brace Wrenches, Washer Cutters, File Cleaners, etc.

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Waverly & Main Cincinnati 12, Ohio

NEW!

MULTIPLY YOUR GRIP 10 TIMES with the PROTO Multi-Purpose Plier

Using a patented, compound leverage design, the No. 234 Multi-Purpose Plier increases your grip 10 times at the jaws. It securely holds square, round or tapered objects. A sensational work-saver. Buy one today from your PROTO dealer. Send 10¢ for 68-page catalog to

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Choose PROTO for your other plier needs. The complete line has the right plier for almost every job.

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You can do DOZENS of JOBS on this DURO 15½" Drill Press!

A "one tool" workshop by itself! Will do sanding, mortising, routing, boring, drilling, tapping!

This versatile Duro 15½" Drill Press performs a multitude of operations easily, quickly, accurately. Modern, precision engineered it will provide years and years of trouble--free service, and become one of the "most used" tools in your school shop. Ball bearing equipped, it has a 0 to ½" chuck capacity; 4¾" spindle travel; 9 splined spindle; drills to center of 15½" circle. Also has the new improved Jacobs "Safe Lock" Chuck, a special safety feature, which prevents chuck from flying off spindle; simple quill tension adjustment and additional wear compensating adjustment; positive depth stop, adjustable depth gauge, built in switches for light and power, plus many other unusual features.

Write for circular, just jam-packed with facts concerning this new Duro Drill Press as well as the complete line of 32 models including the accessories and attachments available.

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Students will thrill at the many new, modern project ideas in this unique project book. It is completely illustrated with photographs, drawings, and step by step instructions. Has many unusual, "first-time" projects never before available. Send 35¢ for a sample copy or save 30% and get 6 issues for $1.50. Satisfaction or money back.

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Send me full information on new Drill Press line.
I enclose ..... for sample copy of Duro Crafter.
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WORLD'S LARGEST MANUFACTURER OF POWER AND HAND TOOLS (DURO-CHROME)

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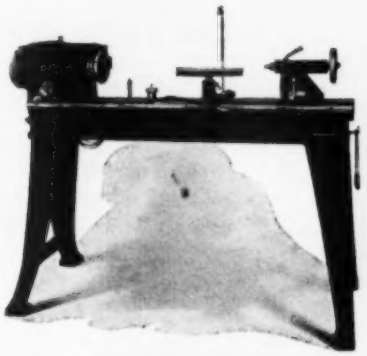
CHICAGO 39, ILLINOIS

DURO

25 years *of top service pays off . . .* "Oliver" equipment is chosen for new Monroe Junior High

In July 1953, these machines were added to the "Oliver" equipment of Monroe, Michigan, schools . . .



The Speed Lathe (Monroe bought two) is a *must*. No. 159A swings 12" diameter, 24" between centers — 48" bed. Speeds: 800 to 2750 r.p.m.

This compact, sturdy Saw Bench is practical for school shops. Cuts a perfect miter, rips, cross cuts, dadoes. Latest safety features.

The 18-inch Band Saw has many refinements of our larger Saws. Handles a wide range of work.

An Oilstone Tool Grinder keeps the students' plane bits, chisels, gouges, knives extra sharp for fine work. Instructors find the No. 384 Grinder unmatched for accurate work.

A heavy-type 6-inch Jointer assures smooth planing and accurate fitting. Fence is adjustable across table.

Mr. Albion S. Taylor, vocational director, finds it is sound economy to use "Oliver" factory-proven machines in school shops

Experience has taught Mr. Taylor that you can *teach more with machines that do more!*

In 1928 "Oliver" equipment was installed in the vocational shops of Monroe, Michigan, schools. Top performance of equipment, its safety features, and continual interest in the equipment by its maker, won the confidence of Mr. Taylor. Recently "Oliver" equipment was selected for Monroe's new Junior High.

"Oliver" machines *do more* because they're built better. They are sturdy, precision built, with scientifically balanced units to effect quiet, vibrationless operation. They are the same machines that are used by industry throughout the world where they have proved their capacity to do more at less cost.

If you are interested in getting the most equipment for your dollar for your school, get all the facts on the extensive line of "Oliver" equipment.

"OLIVER" EQUIPMENT FOR VOCATIONAL SHOPS

Circular Saw Benches	Surface Planers	Sanders
Cut-off Saws	Boring Machines	Shapers
Metal Spinning Lathes	Mortisers	Tenoner
Wood Turning Lathes	Wood Trimmers	Oilstone Tool Grinder
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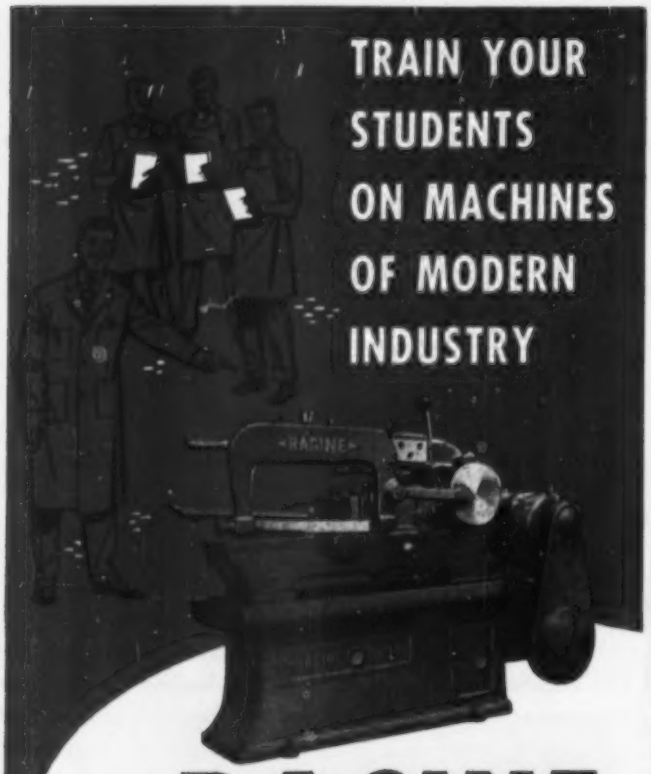
Over 2350 vocational shops use "Oliver" equipment. Tell us the machines that interest you, and we'll send you illustrated bulletins containing full details.

OLIVER MACHINERY COMPANY

Established 1890 **GRAND RAPIDS 2, MICHIGAN**



TRAIN YOUR STUDENTS ON MACHINES OF MODERN INDUSTRY

RACINE

"Utility"

HYDRAULIC METAL SAWS

Easy to demonstrate!

Here's the ideal metal-cutting saw for vocational training . . . ideal because it is the same type machine used by modern industry . . . ideal because it requires only minimum maintenance.

VERSATILE — Racine's "Utility" metal-cutting saw is a durable performer in all metals from soft tubing to hard alloy steels up to 6" x 6". Available in Wet or Dry Cut models.

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STURDY — Built to "take it" . . . in industry and in the school shop.

EASY TO OPERATE — Hydraulic operation provides simplified, trouble-free operation. Pressures are controlled by single graduated dial.

PROVEN — The first choice of leading schools and industries, backed by more than 4 decades of progressive experience in the manufacture of precision machines for training and industry.

Write us about your training machinery needs. Also ask for our complete metal saw line catalog. Address RACINE HYDRAULICS & MACHINERY, INC., 2070 Albert St., Racine, Wis.

RACINE

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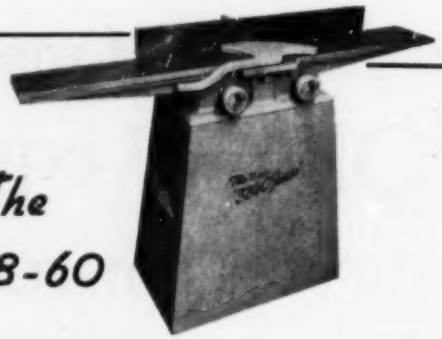

The 58-60

MODERN NEW JOINTER!

60 inch table . . . 37 inch fence

● Here's the new 6-inch jointer with smooth tapered stand designed by Heston & Anderson. Try its big table. See how its 37 inch fence steps up production. Built for heavy duty, the 58-60 will more than do its job in any plant or work shop.

Send today for the name of your nearest dealer!

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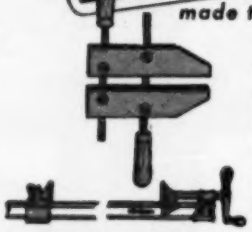
Division of St. Paul Foundry & Mfg. Co.

15-9G FAIRFIELD, IOWA

made to industrial standards



"Jorgensen" HANDSCREWS
Steel spindles—properly seasoned hard maple jaws. A wood working tool that is a "must" for proper training.

"Jorgensen" I-BAR CLAMPS
Adjusts instantly to the work for faster operation. A real improvement over older types.

"C" CLAMPS — "Jorgensen" and "Pony" C Clamps are made in a variety of styles and sizes. Economical and dependable.

"Pony" CLAMP FIXTURES
Mount on ordinary black pipe to make ideal, instant acting, bar clamps. A great school-shop favorite.

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ADJUSTABLE CLAMP CO.
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Professor and student discuss project to make a radial saw bracket from an airplane propeller part, and a sliding overarm from a large wing brace. Tray-Top is set up for boring the bracket. Cintilathes installed by Tornquist Machinery Co., Los Angeles.

Tray-Tops build "learning capacity"

Your Cintilathe dealer will gladly furnish a list of schools in your area which have purchased Tray-Tops. Be sure to ask him for your copies of the new Cintilathe and Cintidrill wall charts, with large pictures and easy-to-read terminology. Ideal teaching aids for school shops.

If your students want lathes with the work capacity to handle man-sized jobs . . . and if you want to make every budget dollar buy the best in equipment value . . . these Tray-Top Cintilathes will top your requisition list. Proof of this fact is in the large number of leading schools now using Tray-Tops. You'll find Tray-Tops resemble high-priced lathes in many, many ways except price. For Cincinnati Lathe & Tool Co. has built in such features as 12 spindle speeds, all geared head, flame hardened gears, one-piece double-walled apron, totally enclosed quick change gear box, direct-reading speed selection—and many other important features—while using modern manufacturing methods to keep the cost low. Swing sizes: 10", 12½", 15", 18". (Flame hardened bedways available.)

best buys in their class!

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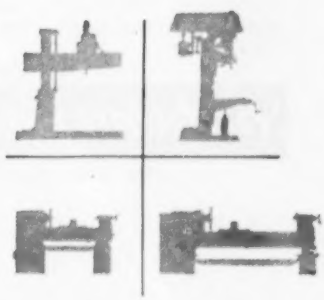
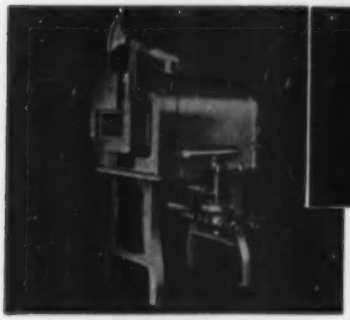
CINCINNATI LATHE & TOOL CO., CINCINNATI 9, OHIO, U. S. A.





Small Semi-Muffle Oven

Sunbeam STEWART

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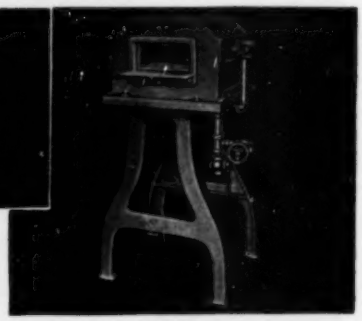

Small Forge

HUNDREDS OF THESE SUNBEAM STEWART FURNACES ARE IN THE VOCATIONAL DEPARTMENTS OF TECHNICAL SCHOOLS

Round Pot Furnace

Because Sunbeam Stewart units have been designed for efficient production heat treating in small shops and tool rooms, they are widely recognized as standard equipment for all types of industrial heat treating and vocational training work. For student instruction and reference, write for our free "Guide to Furnace Selection." Aids in determining the type of furnace best suited for any work. Also ask for the new Data File on school units.

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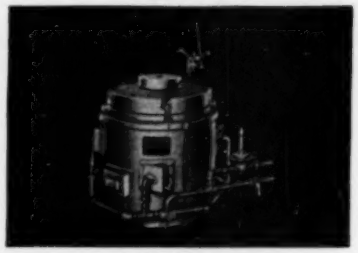
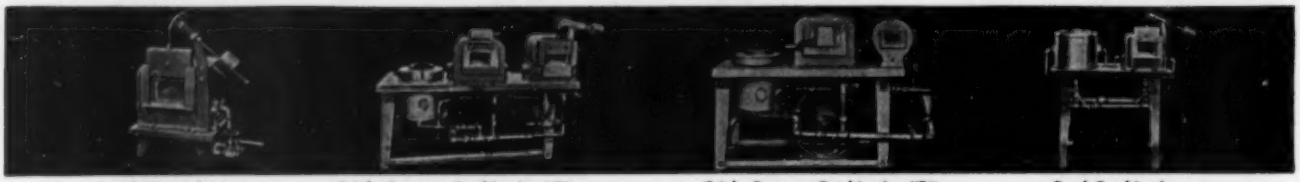


Melting Furnace



Bench Oven Furnace | Triple Purpose Combination "E" | Triple Purpose Combination "D" | Dual Combination

AN ALL-NEW DESIGN! NEW OPERATING EASE! NEW ACCURACY! NEW SAFETY!

Product of *Kalamazoo* experience and the best industrial design talent, Model 8C is the saw you'll want for your school shop. Designed for regular industrial use, Model 8C meets the highest school standards for operating ease, accuracy, dependability *and* safety. Available with casters for easy portability. Get the *facts* and you'll get *Kalamazoo*. Write today.

MACHINE TOOL DIVISION

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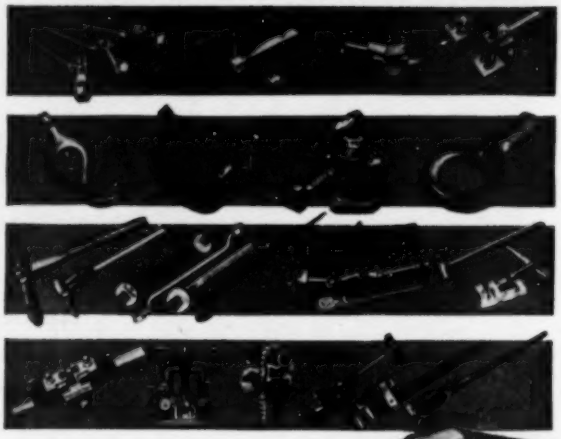
ARMSTRONG



Teach with the standard tools of industry.

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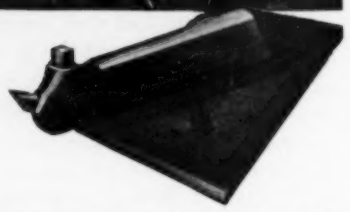

ARMSTRONG BROS. TOOL CO.

"The Tool Holder People"

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SKIL

Belt Sanders serve double purpose!

. . . for vocational training classes
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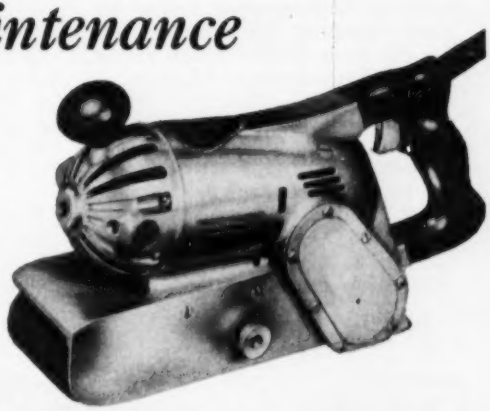
What is more natural than to train students with the belt sander they will use as professionals! SKIL Belt Sanders produce faster work, finer workmanship. They are *school-and-job-proved* to give perfectly smooth finishes on all materials, whether wood, metal or composition.

SKIL Belt Sanders are designed for ease of handling and long life. In maintenance, they excel in refinishing cabinets, desks, blackboards and other school fittings. Cutting out tedious time-consuming hand labor, these SKIL Belt Sanders pay for themselves with the money they save.



SKIL Belt Sander—Model 448—3" belt. Weighs 15¾ lbs. Size: 4¼" wide x 15¼" long x 8½" high. Belt speed: 1200 ft. per minute. Four other models, smaller and larger capacity; also with vacuum attachment.

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Factory Branches in All Leading Cities

SKIL PORTABLE TOOLS

Yates-American Announces a NEW SAW!

WITH "ZERO-IN" POSITIVE ALIGNMENT MICROMETER FENCE ADJUSTMENT

...THE NEW G-110

10" CIRCULAR SAW

*Patent Pending

HERE'S THE NEWEST in the YA Line of woodworking machines . . . the new G-110 10" Circular Saw with the *finest* and *most* accurate control for fence adjustment. It's a beauty, too... has the same modern design as the popular Yates-American J-Line.

Features include: 1. *"Zero-In" Micrometer Positive Alignment Fence Adjustment* for fast, accurate cuts. ***2.** *Fence Rail Extensions* (not illustrated) permit the easy handling of large stock (Furnished as extra equipment). **3.** *Grooved Miter Gauge Tongue* . . . can be extended well beyond edge of table. ***4.** *Mobile Rip Fence* . . . readily removable . . . permits transferring fence to either side of saw without sliding it off the ends of the rails. **5.** *Full 3⅛" cut.* **6.** *Dust Removal Chute* for convenient dust disposal. **7.** *Fully Powered* 3 H.P. maximum.

Write today for complete descriptive literature on this new G-110 Circular Saw and J-Line woodworking machines. You'll find YA your best buy!

THE COMPLETE LINE OF *J-LINE* MACHINES

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INDUSTRIAL ARTS and VOCATIONAL EDUCATION
The Shop Teachers' Professional Magazine

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Industrial Arts in Chicago

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The teachers and administrators in the Chicago public schools are delighted that the American Vocational Association is holding its forty-seventh annual convention at the Conrad Hilton Hotel in Chicago this November. The industrial-arts teachers are especially pleased and would like to extend a cordial invitation to teachers and administrators to visit our industrial-arts laboratories while in Chicago. Tours are being planned to all types of Chicago public schools.

There will be no attempt in this article to describe the Chicago industrial-arts program in detail but rather to call attention to certain phases of the program in elementary and high school which might prove of interest to convention visitors.

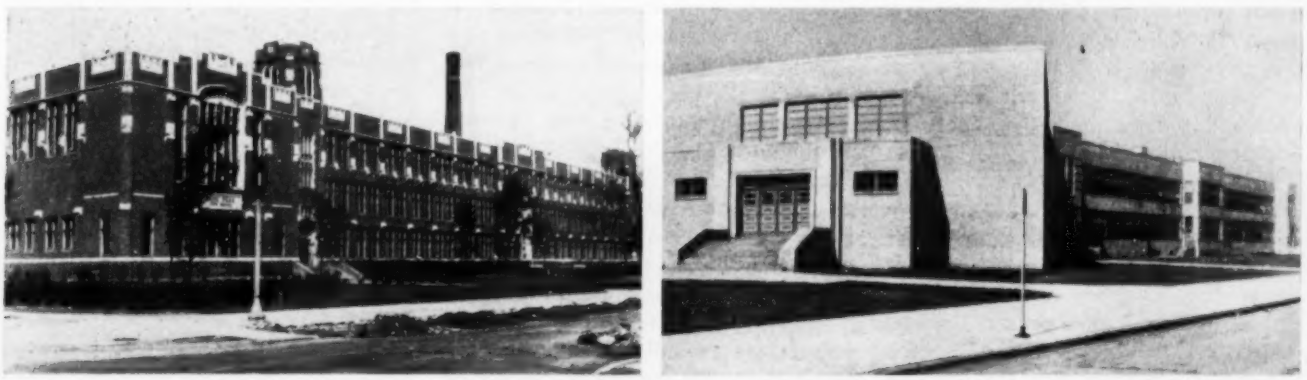
All of Chicago's industrial-arts courses are considered a fundamental and intrinsic part of general education for boys and girls. Industrial arts is that part of general education, whose broad function is to interpret the machine age to the oncoming generation. In colonial times, children could easily observe the cobbler, the tinsmith, the harness maker, the broom-maker, and the blacksmith at work in the community. Today, most of the things that we use are made in factories, sometimes hundreds of miles away. Modern children have lost the easy contact with the crafts which was typical of the colonial village. Industrial arts gives boys and girls an opportunity to work with tools and materials typical of modern industry and to gain an understanding of the production line and manufactured products. It helps them to choose a vocation and to become more intelligent consumers of the products of the machine age. Industrial arts gives an increased understanding of the problems of labor and management.

Elementary Schools

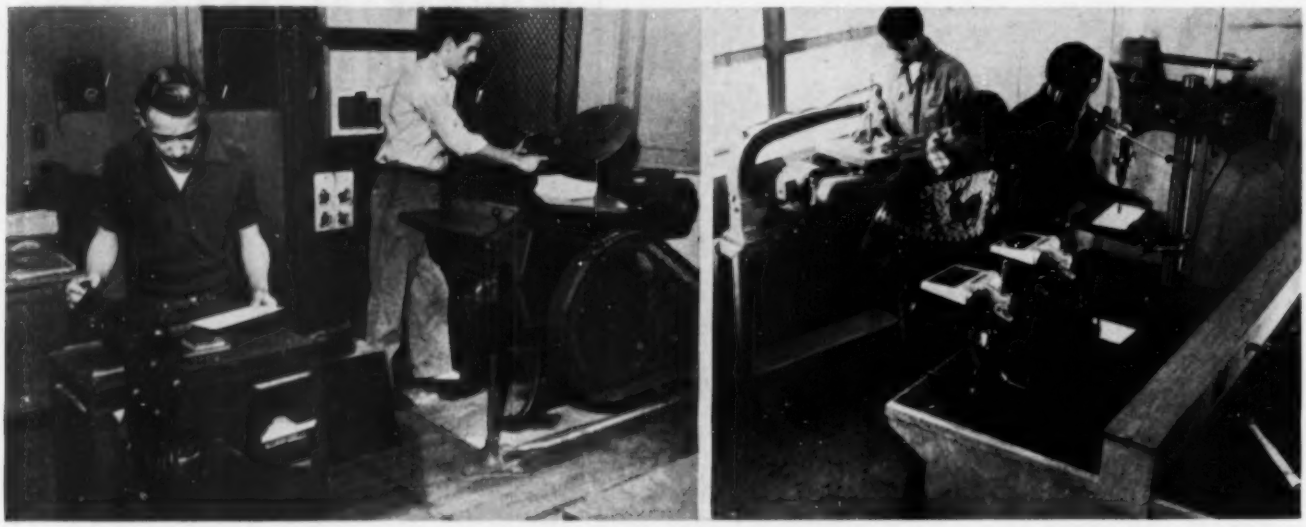
Chicago has over 60,000 boys and girls in grades six, seven, and eight receiving instruction in the home-mechanics laboratory. The home-mechanics laboratory of the Chicago schools is a workshop course wherein boys and girls gain experiences in the practical arts. The work is an integral part of general education. The instruction centers around home and community needs. Information about household needs and skill with tools and materials used in intelligent home living are the outcomes desired for the pupils. The course is jointly supervised by the Division of Industrial Arts and Home Economics.

Objectives

The home-mechanics laboratory course contributes to general education, emphasizes participation in home life activities,



At the left, Gage Park High School, one of the forty-two Chicago general high schools. At the right, the new Hale Elementary School in Chicago. All new elementary schools are equipped with home-mechanics laboratories.



(At left) Graphic arts are an important part of the Chicago industrial-arts plan; (at right) using the power tools in a home-mechanics laboratory

and has the following major objectives:

1. To develop the ability to use a variety of tools and construction materials while making useful and attractive projects.

2. To develop the ability safely and efficiently to service some appliances common to the American home.

3. To develop consumer knowledge by the selection, care, and use of the products of industry.

4. To develop an interest in crafts as a medium for creative expression in out-of-school hours.

5. To develop social understanding and ability to work collectively with others.

To meet better the needs of the educational practices of today the home-mechanics laboratory has incorporated the following educational policies:

1. The instructional content of the home-mechanics laboratory course is closely related to the problems of modern life in the home and community.

2. Less emphasis is given to isolated tool processes and exercises, e.g., making joints and sewing seams without the practical application of these skills.

3. More emphasis is given to the educational growth of the child, and the projects are considered a means to an end.

4. The home-mechanics laboratory course is a regular and fundamental part of the school program, not a special subject.

5. Girls as well as boys are given an opportunity to work with the types of tools and materials which will enable them to meet intelligently the many mechanical problems which arise in the operation of the modern home.

6. Boys and girls are permitted to work with a variety of commonly used hand tools and construction materials typical of modern life.

7. Boys as well as girls need experience with foods and clothing. Both boys and girls have to select food and to buy and repair clothing.

Content

The home-mechanics laboratory course of study includes the following six 20 week units.

Elementary Textiles I — 6th grade
Elementary Home Maintenance II — 6th grade
Home and Clothing III — 7th & 8th grades
Electricity, Utensils, and Crafts IV — 7th & 8th grades
Foods and Nutrition V — 7th & 8th grades
House, Garden, and Crafts VI — 7th & 8th grades

Laboratory and Equipment

The home-mechanics laboratory room is provided with gas, electricity, sinks and running water. Jig saw, drill press, grinder-buffer, 4 electric sewing machines, and 4 stoves, are standard equipment. Benches, tables, stools, tool and supply cabinets are provided to meet the needs of 25 students, which is the standard size class.

General High Schools

There are over 8000 boys and girls taking the industrial-arts laboratory course in Chicago's 42 general high schools. Industrial-arts laboratory is a subject which draws the major part of its instructional content from modern industry.

The industrial-arts laboratory is a shop course designed to interpret the machine age to boys and girls. The work is required of those ninth-grade students who are planning to take a technical sequence. It is an elective course for ninth-, tenth-, eleventh-, and twelfth-grade students who are taking the general high school curriculum. Industrial-arts laboratory courses meet five double periods a week; the standard class size is 25 students.

Objectives

The guiding philosophy of the industrial-arts laboratory course is as follows:

1. Provide experiences with tools and machines typical of modern industry so that the students can explore and test interests and abilities in industrial work.

2. Develop social understanding and ability to work with others as a leader or as a co-operative member of the group.

3. Develop wholesome personality balance by integrating the child's mental, emotional, and physical training, and growth.

4. Develop the skill to recognize quality and good design in manufactured products.

5. Teach the essential elementary skills and scientific concepts necessary to keep

(At left) At work on the foods unit in the home mechanics laboratory; (at right) learning to plan their work

the commonly used products of industry in efficient and safe working order.

6. Develop the tool skills and knowledge necessary to plan and construct useful projects with common hand tools, simple machines, and construction materials in a workmanlike manner.

7. Develop an interest in handcraft as a valuable medium for creative expression in leisure hours.

8. Develop skill in reading and in making drawings, charts, and graphs.

9. Provide an objective medium for learning in mathematics, science, language, arts, and social science.

Forming a ladle in the industrial-arts laboratory, Chicago Public Schools

10. Develop pride in workmanship.

11. Encourage traits of inventiveness and ingenuity in dealing with tools, materials, and simple machines.

Content

The industrial-arts laboratory course is divided in large instructional areas as follows: electricity, metal, wood, plastics, graphic arts, ceramics, and leather. The course is taught in general shops using from three to five units.

The industrial-arts laboratory room is arranged to provide space for a toolroom, a supply room, and a student workroom. Usually these facilities are provided at one end of the laboratory; this arrangement leaves the major part of the floor and wall space for class instruction. The center of the industrial-arts laboratory room determines the type of instruction offered and is kept flexible so that it can be adjusted to meet instructional needs.

The most common room arrangements for the industrial-arts laboratory are the one-room and the two-room types. The one-room is used in a small branch school where it is necessary for one teacher to present the course. The two-room is a good type for a larger school where the enrollment justifies two teachers.

The modern industrial-arts education curriculum is taken from industry and is evaluated in terms of man's needs for an understanding of the machine age and his ability to work with tools and construction materials, in meeting the problems of daily living.

The industrial-arts instructor guides student learning through pupil interest projects, demonstrations, experiments, class discussion, related reading, student tests, individual instruction, visual aids, and trips to industry. The pupil-interest projects should require the use of the fundamental processes and instruction materials and should be considered of value and interest by the pupils; formalized projects or tool exercises are not in keeping with modern industrial-arts teaching. The projects should be well planned by the pupils, and the teacher should require consistently correct use of tools and construction materials in their development.

Firing pottery — a part of ceramic work, Chicago Public Schools

Building a Shop Safety Program

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The shop safety program is considered by any conscientious shop teacher as being of fundamental importance to the general success or failure of the total shop program. The success or failure of such a program hinges on the seriousness which accompanies the effort to develop safety consciousness in the individual student. Any program taken lightly in both its conception and continuance is doomed to failure. The answer to successful shop safety seems to be an active program, constant and serious in nature.

No machine or tool has ever been manufactured that is more important than the health and safety of any individual. A properly guarded machine, operated by a properly instructed student who understands and respects the machine, is not dangerous. It is the responsibility of the instructor to keep all tools and machines under his jurisdiction in proper operating condition; it is also his job to see that these tools and machines are properly guarded. Mechanically, this is as far as the instructor may go in assuring safety in his shop. The mental set of safety consciousness in the individual student, however, is another, far more difficult matter.

Proper and thorough instruction in the operation of tools and machines contributes largely to the development of safety consciousness. In demonstrating the use of tools and machines, the instructor must emphasize the fact that there is only one way to operate all units: *the safe way*. In giving the student supervised experience on different tools and machines, the instructor aids in developing the student's confidence in his ability to operate and use the equipment at his disposal.

When the majority of shop safety programs are analyzed, the one consistent factor found in each is the attempt to develop safety consciousness in the student. The manner in which this attempt is made varies, of course, with each program. The success of a safety program, if the mechanical and instructional aspects are properly carried out, depends on the degree of attainment of this factor. The question, then, seems to be, are shop teachers cognizant of the mental factor in shop safety: are they giving it the emphasis it so obviously requires?

The shop safety program in the industrial-arts department at Coshocton High School, Coshocton, Ohio, is an example of an attempt to develop not only normal safety habits, but safety consciousness in each student taking part in the shop program. Through an organized program of demonstrations, posters, films, study periods, tests and discussion panels, the student is made to feel that he is an essential part of the safety program, and directly responsible for its success. Safety is made as much a part of the total shop program as is the operation of a machine or the completion of a project.

At the beginning of each semester, all students enrolled in industrial arts are given an eight-page safety bulletin, written by the staff and based on the equipment and materials found in the Coshocton shops. The contents of the bulletin are discussed point by point in an informal class session and the different operations possible on each machine are demonstrated by the instructor. After the students have had sufficient time to study the safety bulletin, they are given a test based on the bulletin which they are required to pass with a grade of 100 per cent. Not

Welding Shop, Coshocton High School, Coshocton, Ohio

until the student has passed the safety test is he permitted to use the equipment found in the shops.

Before the student is permitted to work, however, he must have a card signed by his parents which gives him permission to operate machines and also guarantees the payment of all bills accumulated by the student. If a student's parents do not wish to sign the card, the student is transferred to another, less hazardous, class.

One of the officers in the shop personnel organization is the *safety engineer*, whose responsibility it is to see that all safety rules and regulations are obeyed to the letter. This student is given more-or-less complete authority over the other students in his class so far as enforcing safety rules are concerned. Having guidance and instruction coming from one of their own number helps the students to feel that the safety program is important to them both personally and as a group.

Any student found violating a safety rule is placed on a *restricted* status, which removes his privilege of operating all machinery. This sometimes renders a hardship on a student, but a short period of strictly hand work gives the boy ample time for thought. After a few days of tedious hand work, which could be swiftly taken care of mechanically, a student more fully appreciates the use of the power tool. When the instructor feels that the student has had time to realize the possible implications of the violation as concerns the machine, himself, and those around him, he is permitted to resume machine work.

Special attention is given to the care of flammable materials. The fire hazard around such areas as the machine shop, printshop, welding and automotive shops, and finishing area, justifies purchase of all available safety containers, fire curtains and shields, and fire extinguishing apparatus. Each student is trained in the proper use of these materials with special attention given to fire extinguishers. Small fires may be extinguished immediately by shop personnel, thereby removing the danger to the entire school.

The emphasis given to the shop safety program is a direct result of a need that developed with the increased program and shop enrollment that has come in the past few years. Just seven years ago, the total shop program at Coshocton High School consisted of three areas: printing, drawing, and woodworking. Since that time the program has been expanded to include the following areas: graphic arts (printing, drawing, and architecture), electricity, metal working (bench and art metal), machine shop, photography, automotives, welding (gas and arc), plastics, woodworking, and upholstery. It is obvious that the additional areas present new and adverse problems in the light of working hazards. Other factors present themselves safety-wise, making the shop setup at Coshocton unique: the areas are taught on a unit basis in six different shops under the supervision of two instructors. The shops are split up into two sides of three shops each, separated by a corridor. The need for a highly organized shop personnel organization and safety program is evident. When an instructor is in one of the shops, although they are connected by glassed-in partitions, he is not always immediately aware of the activities in the other two shops under his supervision.

In a setup as is described here, mere conscious observance of shop safety rules is not enough. There must be present in each student a deeply ingrained sense of safety consciousness which guides his every action.

The National Safety Council has been of great assistance to the shop staff at Coshocton. This organization publishes a monthly magazine from which the enterprising reader may gather invaluable information that may be applied to the school shop situation. Available from this organization are cleverly designed, thought provoking safety posters which lend themselves readily to the school shop.

Probably no other single factor, with the exception of properly guarded machinery, reduces the accident rate more than color dynamics. The machinery, walls, ceiling, and floors at Coshocton are treated with this in mind, capitalizing on the experiences of industry as published by most of the major paint manufacturers. A well-lighted shop, painted so that the working areas of machines are outstanding and well defined, considerably assist in the development of the safety program. Care is taken to explain the reasons behind each color factor, so that the student appreciates the relationship between color and function.

More About Advisory Committees

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In the January, 1953, issue of INDUSTRIAL ARTS AND VOCATIONAL EDUCATION the Purpose and Utilization of Advisory Committees was discussed. Several requests have come in for additional information on committee policy, typical problems to present to committees, types of advisory committees, how members are selected; what qualifications should be required in a committee member, how often does a committee meet, and how to report a meeting.

This article will provide some answers to these questions:

Question 1: What is the basic policy to observe regarding committee recommendations?

It is a basic policy of advisory committee procedure that a committee serves in *advisory capacity only* to assist school authorities in the administration of a specific trade.

Recommendations made by an advisory committee to the school authorities should be constructive.

Question 2: What are some typical problems to present to advisory committees?

1. Understanding of public school functions and programs: general aims and specific purposes.

2. Securing up-to-date and accurate information concerning the requirement of success in business or industry.

3. Placement of graduates.

4. The securing of new equipment.

5. The problem of keeping the instructor closely allied with industry so that he may bring the latest techniques and knowledge to his students.

6. The recruiting of students.

7. Review of curriculum in the light of present local needs.

8. A need for understanding the people and their needs.

9. The need for people to understand the educational program.

Question 3: How many types of advisory committees are there?

1. Advisory committees that are formed according to the standards required by the federally reimbursable programs (Smith-Hughes). These committees are formed to service: (*a*) trade preparatory classes, (*b*) apprenticeship classes, or (*c*) classes that pertain to employed persons who desire to "extend" their knowledge and skills.

2. Advisory committees that are organized outside the federal regulations for the purpose of developing curricula or new courses which a given community may need. These committees are concerned with all types of classes and programs that do not fall under the federal requirements.

3. A third type of advisory committee is set up on a "temporary" basis to assist a school administrator in determining the need for initiating a specific trade class. This committee serves as a "steering" committee until class activity actually starts or other decisions are made.

4. A fourth type of advisory committee is sometimes appointed to assist in the development, maintenance, and evaluation of an entire vocational program for a single school district, or a single department or school. This type of committee ordinarily applies to the smaller districts. Generally speaking, general advisory committees are for the development of policies and consideration of the over-all plans of the program.

Question 4: Who selects committee members?

a) There is no set pattern on the question of committee selection. The procedure must be different when the size of the school system is considered. Large school systems delegate the responsibility of vocational education to personnel assigned to that specific task. In a small system the public relations contacts of the school superintendent naturally include professional and industrial leadership of the community; hence he might select advisory committee members.

b) The place and importance of the trade instructor must not be overlooked, as he should have a trade background which would enable him to effectively make good suggestions as to advisory committee membership.

c) If the advisory committee concerns a trade not yet included in the school curriculum, the director of vocational education or other key school person would be responsible for a careful survey of prospective committee members.

d) Large trade schools usually operate *on their own*. The superintendent of schools or the board of education sets the policy of *no trade classes without advisory committee approval;* then the school takes over and selects committee members with the aid and council of the instructors and with the help of employer and labor organizations.

Question 5: What are the qualifications of the committee members?

1. Committee members must be selected from representative groups as the success of vocational classes is based on the cooperation of educational authorities, employer and labor organizations, and sometimes the manufacturer.

NOTE: It must not be overlooked that the original Smith-Hughes Act which was passed by Congress without a dissenting vote on February 23, 1917, was largely developed and written by key personnel in the ranks of labor working under the direction of that venerable labor leader Samuel Gompers. Hence labor is vitally interested in vocational education.

2. In certain cases manufacturers should also be included. The value of a manufactured item, quite often, is no better than its appearance after it is in its intended place. Hence, manufacturers *are* interested in trade training, in order to be sure there are sufficient qualified craftsmen available to use the product being made correctly and properly.

3. When organization representatives cannot be secured, then *key and influential personnel* in the industry should be selected.

4. The interest in and knowledge of vocational education by the prospective committee member is vital to the success of advisory committee meetings. Interest in vocational education is assumed to mean an interest in the welfare of both youth and industry.

5. Committee membership provides an opportunity to contribute maximum service to educational and industrial interests in the community.

Question 6: Are consultants used in advisory committee procedure?

There are several other agencies interested in the success of vocational classes which should have representation on an advisory committee *as consultants, but without power of vote.*

a) The State Department of Employment is interested from the viewpoint of placement and hence can be quite helpful in suggesting possible employment trends.

b) If apprenticeship is involved, then the state or federal representatives should be included.

c) The principal of the school, the director of vocational education, the head of a specific trade department in the school and the instructor usually meet with the committee as consultants without power of vote.

d) Curriculum supervisors of Trade and Industries (if there are such persons in the school system) should be included as consultants particularly if the advisory committee is a new one and the curriculum for the new class is to be planned and developed.

Question 7: How often should committees meet?

a) If the advisory committee is a new one exploring the possibilities of trade classes or the need for a new vocational class several meetings might be necessary within reasonably short periods of time.

b) If an advisory committee has been set up and its recommendations have been followed and a trade class organized, then a yearly meeting is considered sufficient.

NOTE: Meetings held too close to a preceding meeting could react unfavorably against the school if it worked out that the business at hand was not sufficiently

important to take the time of the members of the committee to meet and discuss the problem.

Question 8: How much preplanning should be done prior to a meeting?

a) A *preview* of the meeting between school staff, instructor, and conference leader should be held at least three weeks in advance of the advisory meeting to plan carefully the details of the meeting.

This *preview* is of the utmost importance; in no sense should it be considered a method to *railroad* a plan of action through a committee. It should be obvious that such an approach would be disastrous and would kill the effectiveness of committee public relations at once.

b) An agenda for the meeting should always be worked out based on past experiences in the vocational class.

1. Have the preceding committee recommendations been followed?
2. Is the industrial situation as regards employment satisfactory?
3. Are there any new developments in the trade that require the counsel of a committee?
4. What objectives are to be presented to the committee which need careful study?
5. What questions should be asked?
6. Which questions to ask first.

c) At the preview the key questions are prepared and, about ten days prior to the meeting, sent to each committee member along with the invitation to attend.

d) Names of committee members should be printed in large letters on cards. These cards are placed in front of each person when the committee meets. This is a very quick and easy means of making possible the identification of each member during the discussion.

Question 9: How are advisory committee meetings conducted?

1. *Advisory-Committee-Chairman Type*
   a) An agenda is prepared prior to the meeting and notices sent to each committee member.
   b) When the committee assembles the school administrator takes the lead and introduces all members.
   c) The members then elect a chairman to carry on the meeting and also to be available for contact throughout the ensuing year.
   d) The newly elected chairman is handed a written agenda which outlines the details or questions to be discussed. He puts the motions and in general leads the discussions.
   e) Key questions are asked by the school staff members as well as by committee members; in this way the school personnel can help keep the discussion pointed to the hoped-for recommendations.
2. *Conference-Leader Type*
   a) For *new* committees it has been found advantageous to invite a trained conference leader to conduct the meeting.
   b) The school administrator acts as temporary chairman, introduces all committee members and consultants; describes the basic policies of the educational institution he represents, announces the purpose of the meeting, and appoints a recorder to take down the discussion items and decisions as they are placed on the blackboard by the conference leader.
   c) The conference leader, who has been oriented on the problems at hand during the *preview* is then introduced.
   d) The conference leader conducts the meeting, using recognized conference-leading techniques to secure the widest participation of each member. His main responsibility is that of *pulling out, organizing (on the blackboard), evaluating, and recording all pertinent information, committee decisions, and recommendations.*
   e) At the *end of the meeting* a chairman is elected from the advisory committee members. He serves as a contact man throughout the year (or until the next meeting) to advise and council school personnel on problems which might eventually necessitate another advisory committee meeting.

Question 10: What, if any are the advantages of the conference-type meeting?

1. As long as the conference leader has been apprised of the hope-to-be-attained objectives, he can, without pressure, keep the discussion on the track.

2. *All* personnel present have an opportunity to make statements which are recorded on the board and then evaluated.

3. When a committee chairman is elected to conduct the meeting it can and does happen that he has had no experience in conducting meetings; hence must be constantly prompted by the school administrator as to what to do. This does not happen in the conference-leading type of meeting.

Question 11: How is an advisory committee meeting recorded?

a) The report of the Conference-Leader Type of advisory meeting is based on the blackboard work of the conference leader and the notes taken by the recorder and includes such items as:

1. Personnel present (title, address, and telephone number).
2. Personnel absent.
3. Introductory statements, briefed to very simple statements.
4. Briefed statements of the conference leader.
5. The questions discussed are listed in orderly sequence; the discussion items plus the agreements reached are listed under each question.
6. A summary of all recommendations made. This is the nub of the report.
7. *Next steps* and who will do what.
8. A *thank-you* statement from the school administrator.

b) In the Advisory-Committee-Chairman Type of meeting one person acts as secretary and takes notes of recommendations and motions. He then makes up a short report from these notes:

NOTE: The basic difference between the two reports is in terms of details. Due to the development of the various topics on the blackboard it is quite easy to make a detailed report from a conference-leader type of meeting.

Question 12: What is done with the report?

a) Reports are mailed to each committee member, both present and absent. Run off at least double the number required to mail; these extra copies are filed and used as reference material at the next meeting.

b) A report serves as an excellent reminder to school administrators and instructors to carry out all recommendations

that are feasible in keeping with school budgets, shop space, and facilities.

Summary

The lay advisory committee may be the key to education's problems to secure community understanding of education's needs. The values of an advisory committee can only be gained by the effective use of them in terms of selection, curriculum preparation, and evaluation.

The selection of an advisory committee is not enough. Its values must be developed. There must be a continuous follow-up to keep two-way communication alive and fruitful. Both the school and the advisory committee should understand each other. It is a dual responsibility and from the school's standpoint it must be made to work.

A good advisory committee can interpret the school's vocational program to the public and gain its understanding and support.

Committee members also bring about an understanding of the purpose and functions of the vocational program and an appreciation of how the school is meeting its responsibilities to society by reporting back to their own groups the information they have gained from their contacts with the vocational program.

"I would suggest that a library of carefully selected books and booklets be available for use by the different members of the committee in order to develop a real professional atmosphere in the committee meeting.

"The selection of suitable material for an advisory council library will take considerable time and it will also take time to keep the library up to date.

"However, the members of an advisory council if they are going to function constructively should adopt some type of constructive program for themselves in order to be in a position to offer worth-while ideas and suggestions to the school authorities."

A suggestion by John a Backus, formerly Manager,
Department of Education,
American Type Founders Inc.,
Elizabeth, N. J.

Detergents, most of which are made with petroleum, bubbled up in popularity in the past five years, and production figures rose from 400 million pounds a year to 1.8 billion pounds. — *Petroleum Newsnotes*

Kindergarten Teachers Learn Shop Skills

M. J. RULEY

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At the request of a number of kindergarten teachers in the Tulsa schools, an in-service class was set up for the second semester 1952–53, to help them with their practical arts activities. Each of the kindergartens is equipped with a few simple hand tools, workbench, sawhorse, vise, etc. Many of the teachers wanted information on the care and use of these tools.

The class met five times and was conducted by M. J. Ruley, supervisor of industrial arts and vocational education.

At the first meeting a discussion by the group brought out certain needs of the teachers as they used this area of practical arts to implement their units of study.

These needs are as follows: facilities, equipment, supplies, construction projects, tools and their care, and actual practice in the use of tools.

In the succeeding meetings, demonstrations were given in the care and actual use of the tools. The teachers constructed various items for use in their kindergarten, putting into practice what they had learned.

Supplies were discussed, such as kinds of lumber, sizes and types of nails, and the availability of these items.

At the last meeting, the work of the class was evaluated. The teachers decided they had developed confidence in the use of the tools. They knew what tools the children could use. They developed an added interest in this phase of kindergarten activity. Knowledge was gained in the various materials that would be used. Instruction materials were also developed for use by teachers as the class progressed. At the end of the class each teacher had a guide that she could use for future reference.

This type of co-operative effort between departments of a school system is recommended as one means of contributing to the education of boys and girls, as well as developing a better understanding among teachers about industrial arts in the schools.

Kindergarten teachers in an in-service class learning shop skills

Leaders in Industrial Education

WILLIAM T. BAWDEN
Emeritus Professor
Kansas State Teachers College
Pittsburg, Kans.

DAVID SAMUEL SNEDDEN

Coming from the ranks of general education, the subject of this sketch, David Snedden, may be said to represent the field of sociology, or perhaps more accurately, educational sociology. Although he had previous experience in school administration, as principal of high school and superintendent of city schools, he himself dates his special interest in the problems of vocational education from his term of service as professor of education in Stanford University, 1901–05.

Family Background

Samuel Snedden, the father of David, went to California in the "Gold Rush." Leaving his home in central Pennsylvania at the age of 18 years, he traveled with a small party, crossed the Isthmus of Panama, and arrived in San Francisco in January, 1850. For 15 years or more he "prospected" up and down the coast, from British Columbia to Mexico, and finally settled in Kern County, California, where he married in 1867, bought a small herd of cattle, and turned to ranging on the free land. Here David Samuel was born, also a brother and three sisters.[1]

In 1879, seeking improved conditions, the family moved to Lockwood Valley in northern Ventura County. This involved driving the herd of cattle on the 140-mile trek to the better pastures of the new location. On this journey, 11-year-old David and his brother, 16 months younger, already adept at horseback riding, took their shares of the work, including "night herding" for four-hour periods. In retrospect, David Snedden referred to the exceptional opportunities for bodily health and growth during childhood and youth, for rich experiences with work and nature, and for wholesome associations, "all of which have from the early settlement of our country come to thousands of boys reared in frontiering families."

His mother early taught him to read, write, and spell, so that in later years he was unable to remember when he learned to read. He recalled that by the age of seven or eight years he had read much of *The Vicar of Wakefield, Pilgrim's Progress,* and several of the *McGuffey Readers.* During his childhood there was no school within 40 miles of the home. Not until September, 1884, when David was 16 years old, did he have his first opportunity to attend school, with his brother and three sisters, by walking two and one half miles. By that time he had progressed far enough in arithmetic, spelling, handwriting, and grammar, that when he entered the school in 1884, the teacher placed him in the eighth grade.

Early Schooling

Here he progressed rapidly, and when he entered the recently opened St. Vincent's College, in Los Angeles, in the spring of 1887, he was not required to take work in the academy, but was admitted to college classes. Here the classes were small,

David Samuel Snedden

and he received considerable individual attention, and completed the work for the A.B. degree in June, 1889. He was the second student to receive that degree at the institution, at that time the only college in southern California. It later became Loyola University.

At this period he spent much time in the public library and began extensive reading of what he himself described as "the more or less heretical works" of Herbert Spencer, Thomas H. Huxley, Charles R. Darwin, "and other nineteenth-century radicals, under whose incentives he presently developed philosophies far removed from that of St. Thomas Aquinas which Father Dyer had earnestly taught him."

[1] In the preparation of this sketch I have made free use of material from *Recollections of Over Half a Century Spent in Educational Work,* an autobiography by David Snedden. Printed privately by the author in 1949, 80 pages. Obtained by loan from the Cubberley Library, Stanford University, Palo Alto, Calif.

Teaching as a Career

After being graduated from St. Vincent's College, Snedden planned to take up teaching for a time as a means of earning money for further study, having read and heard that many famous Americans had spent their early years as teachers. In college it had been assumed that he would prepare to become a lawyer, although he "was not especially attracted to that profession."

During the summer of 1889, he became acquainted with the superintendent of schools of Ventura County, secured a teacher's certificate, and began his teaching career in the Fairview district in the fall of that year. Late that fall he attended the annual county teachers institute, with 60 other teachers, and was greatly impressed by the addresses to which he listened. One of the principal speakers "idealized the teacher's vocation," and aroused Snedden's ambition to make a life career in that field.

His second year of teaching was in Fillmore, where he had charge of an ungraded school of about fifty pupils. At the close of this term in early May, 1891, he was requested to go to Santa Paula to complete the term of a teacher who had been taken ill. At the close of this year the principal resigned, and Snedden was offered the position. Here he had the supervision of six teachers, and himself taught the eighth grade. After one year as principal of the elementary school, 1891–92, he was appointed principal of the Union High School, and served in that position three years, 1892–95, during which time he "developed some feelings of a professional man."

The trustees of the high school were ambitious to have the school accredited by the State University. After inspection, the work in certain courses was accepted, but Snedden was adjudged inadequately prepared to teach chemistry, and the high school was rated as not properly equipped for courses in physics. And so at the close of his first year as principal he enrolled in the Summer Session at Stanford University to prepare himself for accrediting of the science courses in his second year. Also, he was appointed a member of the County Board of Education early in his first year as principal of the high school.

All these experiences confirmed Snedden in his growing ambition to advance in the teaching profession. He began making plans to attend Stanford University, and to work there for an A.B. degree. He had also by this time had his first experiences in preparing papers on professional educational subjects for presentation at the annual county teachers institutes. He also found congenial associations among the leading professional men in Santa Paula, and carried on frequent and stimulating discussions with them.

In the spring of 1895, Snedden resigned his position in Santa Paula, and in October he enrolled in Stanford University, where he was allowed two years of advanced credit for his work at St. Vincent's College. In order to earn money for his expenses at Stanford University, he found employment during the summer months with a fruit grower who owned a large apricot orchard in Ventura County near the coast. The coastal fogs prevented the drying of the fruit at the orchard, so a cutover grain field was leased farther inland, at Fillmore, where the hot and dry summer days were especially favorable for the purpose. More than 400 tons of fruit were shipped by rail, and at one period more than 100 men, women, and children were employed to cut, treat with sulphur, and spread the apricots in trays in the sun. Snedden's work was managerial — hiring, paying, and supplying the workers.

Superintendent of Schools

He found his work at Stanford University highly "profitable and enjoyable." Having now made up his mind to follow teaching and school administration as a professional career, he majored in the Department of Education, where he came under the influence of some of the leading educators and thinkers of that day. Completing the requirements for the A.B. degree in June, 1897, he was appointed principal of the high school and superintendent of schools in Paso Robles, in September of that year, a position for which he was recommended by President David Starr Jordan.

He remained in Paso Robles for three years, 1897–1900, during which period he was able to bring about the accrediting of the high school by the State University. He was appointed a member of the County Board of Education. He also began to take an active part in the State Teachers Association, and was one of the organizers of the California High School Teachers Association. He was a member of the committee that waged the first campaign of the latter Association, which was successful in inducing the State University to accept for admission a modern language on a par with Latin.

During this period of three years at Paso Robles, Snedden began the more or less definite formulation of beliefs in regard to educational theories and practices which were to find fuller expression in later years. He was becoming keenly interested in *educational sociology*, which later became "the core of his studies of educational philosophy." He also gave much thought to "educational sciences as sources of educational values," a theme which he derived from Spencer's famous query, "What knowledge is of most worth?" During this period he wrote several important papers which were published in a local journal. He attacked the tradition which made Latin a required study for admission to the University. A little later he "scandalized his audiences" by his constant reiteration of the question, "Why should girls in high school be required to study algebra?"

At this time he was reading Lester F. Ward's *Dynamic Sociology*, and Franklin H. Giddings' *Sociology*. From these and other readings, as well as from his own teaching experience, he was becoming convinced that an important future belonged to the study of *educational purposes*, or *objectives*, a study which was to play a prominent part in his thinking and in his career for many years.

College Teaching

In the spring of 1900, Snedden was invited to be one of the speakers at the Annual Alumni Conference at Stanford University, and chose for his subject, "The Social Aspects of Education." During this visit to the University, Snedden told President Jordan, and Dr. Ellwood P. Cubberley, recently appointed director, later dean, of the Department of Education, of his decision to resign as superintendent of schools at Paso Robles, and to proceed to Teachers College, Columbia University, for further professional study. Before he left Stanford, at the close of the

Conference, Snedden was offered an appointment as instructor in the Department of Education, to take effect upon his return from a year of study at Columbia University.

He has chosen a propitious moment at which to seek opportunity for advanced study at Teachers College. Dr. James E. Russell had recently been appointed dean, and had begun to organize a faculty of notable educators, and "Teachers College was well started on its subsequent history as the most progressive educational agency in the United States." Snedden's thinking was strongly influenced by the "Report of the Committee of Twelve," dealing with the relative values of the studies in the curriculums of the schools. The Committee was created by the National Education Association, and its chairman was Charles William Eliot, president of Harvard University, who had attracted nationwide attention, by no means all favorable, for his advocacy of elective studies in college.

Under the influence of the ideas promoted by President Eliot, reinforced by the recently published, *Elective Studies in High Schools*, by Paul H. Hanus, professor of education at Harvard University, Snedden chose as the subject of his proposed master's thesis, "The Significance of Elective Systems of Studies." He was, therefore, especially intrigued by the report of the Committee which was stirring up considerable excitement and debate in educational circles all over the country. In its report the Committee held that the values of studies, in secondary school and college, lie, not in their intrinsic content of knowledge or skills, but in the processes used in teaching them. It was argued that if the studies are well taught, the processes of teaching train the mental faculties of the learners — their faculties of memory, reasoning, observation, critical thinking, and others. If this reasoning be accepted, there follows "the doctrine of the equivalence of studies — that is, if all are equally well taught!"

The opposition held that the chief values of studies lie in their contents — the functioning knowledge, skills, ideals, and other useful learnings which result from their study and mastery. Methods of teaching are of secondary importance.

At this juncture, William James, professor of psychology at Harvard University, "entered the discussion with what was perhaps the earliest attack on what came to be called the *faculty psychology*." He denied that there is any such thing as a "faculty of memory," which can be so trained by specific exercises as to be applicable to any and all learning materials.

Stanford University

In the summer of 1901, Snedden returned to California to take up his new work in the Department of Education at Stanford University, 1901–05. "In several respects the following four years were the most strenuous in his career." His assignment involved the offering of courses to two well-defined groups or classes of students: (1) young persons planning to become teachers; and (2) experienced teachers taking further professional work, many of these in Saturday classes. In addition, he was in frequent demand for addresses at teachers institutes, and in this capacity he visited 15 counties during the four years.

Much of this discussion was outside of Snedden's range of interests, but he has recorded that "more and more he perceived that the value of Latin or algebra, music or history, shopwork or literature, and all the other studies which were multiplying in both college and secondary school courses, must be determined by their effects on the learners as citizens, workers, players, cultured and healthy men and women."

(To be continued)

Lesson Planning

TROY C. BOND
Assistant Principal
Dallas Vocational School
Dallas, Tex.

Teachers in the Dallas Vocational School have worked out co-operatively a plan for using the "4 step method" of planning each lesson to be accomplished in the school. The procedure is applicable to any of the 14 courses offered in the school's curriculum. Some teachers use a very simple method of briefly outlining plans on small cards in just a few words, while others write out the details more elaborately for use with future classes.

The plan consists of:

I. *Introduction.* State the objective — the why — tie the new to the old — stimulate the student — show some enthusiasm — use samples and exhibits — put the class at ease — don't waste time.

II. *Demonstration.* Perform the operations — give an example — based on job breakdown — a step-by-step procedure — go slowly — emphasize important points — don't forget safety — repeat key points.

III. *Application.* Assign student to job — have steps of procedure available for reference — assist where necessary — walk the beat — circulate among the class — repeat parts of demonstration — see that the step-by-step procedure is followed.

IV. *Follow Up.* Check and double check — test — grade work.

The plan is being used in the Dallas Vocational School in related theory classes as well as in regular trade school classes. It also is applicable in a mathematics class, an English class, or a class in history.

INDUSTRIAL ARTS and VOCATIONAL EDUCATION

JOHN J. METZ, Editor

A CHARITY DRIVE IN SCHOOL

Numerous community chest drives will be under way soon. Should the shop teacher do something about them? Probably it is not one of the objectives of industrial arts and vocational education, but it might be forced into them by emphasizing the assistance given to others as a vital part of the idea of co-operation which we try to emphasize in all shop training.

Naturally, in the school shop co-operation means largely the assistance which one student gives to another in performing an operation or helping someone while he performs an assembly or finishing job. Emphasizing this kind of co-operation is very necessary.

But what about preparing our boys to help less fortunate students? Let's consider what some of the poorer youngsters may need, such as clothing, shoes, school books, stationery, writing materials, and the like.

Cash donations may be collected by the shop teacher if it is not done by the school, in order that the class can present its own community chest donation. But over and above this, students may be taught to donate money and shoes or clothing or toys which less fortunate students need. Doling out such gifts must be done with circumspection. It is not well to give the donations of clothing received in school to boys who are in the same class with those who brought the gifts. It would be too embarrassing to those who were the recipients of the alms. To overcome this, several schools might exchange the items of clothing which they gathered so that none of the students would know where the gifts had come from nor who had received them.

Altruism is a virtue, that should be fostered at home and in school. Unfortunately, very little is found in some homes, hence, if this type of training is to be given, the shop teacher might well try his hand at it with the students in his classes. He may be surprised, and surely he will be edified by the reactions of some of them. They in turn will learn something about the satisfaction derived from giving, and also something about how the less fortunate have to live.

Incidentally, this drive could be kept up throughout the school year and thus generate a charitable habit in the young — a habit that is sorely needed now.

OVERCOMING SEVERE HANDICAPS

A news release from the office of information service, New York University, dated May 25, 1953, reports a story of persistency and hard work that many of our students ought to hear about.

One of the students in the 1953 graduating class at New York University was Robert Smithdas, who is blind and deaf since he was 10 years old. At the 1953 graduating exercises he received the master of art's degree. He is now 27 years old. His feat was made possible because of the aid given him by his friend, companion, and fellow student, John Spainer, who transmits lectures and vocal discussions to Robert Smithdas through a sensory-sign language, by movements of his fingers as they rest in Robert's hand. Robert's private study is done with books that have been Brailled for him.

Robert Smithdas was stricken with spinal meningitis when he was six years old. It left him totally blind and within three years he also lost all of his hearing.

He finished grade school at the Pittsburgh School for the Blind, and went on to Perkins Institute and Massachusetts Home for the Blind in Watertown, Mass. Officials there became aware that he had unusual abilities and sent him to the Brooklyn Industrial Home for training in manual skills.

He broke all production records in Brooklyn and continued to show far-above-average mentality. Officials of the Industrial Home arranged for a state scholarship for Robert, and St. John's University was willing to co-operate. Searching for someone who would accompany him to classes and translate to him through the manual alphabet, Robert met John Spainer.

Except for his hearing and seeing handicaps, he is normal in every way. He has an extra-keen sense of humor and gets a joke as quickly as those about him who can hear. He writes in his spare time. He is a poet and a short-story writer and two of his stories have appeared in nationally circulated magazines. He is already at work on his autobiography.

Moreover, he is an excellent athlete. His favorite sports are wrestling, swimming, and fishing.

Robert's immediate career plans are centered about public relations work for the Brooklyn Industrial Home for the Blind in which he believes with enthusiasm. Much of that work will involve field trips in and around New York. He will lecture before schools, educators, and civic groups on how the blind can be helped toward economic self-sufficiency, if not complete independence.

An example such as he has set cannot but help young students. Better acquaint yours with Robert's story.

THE NECESSITY FOR GOOD DRIVER EDUCATION

A bigger role for education in the nation's efforts to reduce highway accidents was urged by Price E. Clark, educational director of the Association of Casualty and Surety Companies, in an address before a state-wide meeting of 300 health and safety teachers.

The constantly growing accident toll was described by the speaker as "the greatest uncontrolled social, economic, and humane peacetime problem confronting the nation, second only to national defense."

If good driver education programs were to reach all future drivers attending high schools, much headway in cutting down the present awful highway carnage would have been made. About 8000 such courses are now offered by 8000 U. S. high schools, teaching 700,000 students annually how to be safe drivers. Adult driver education programs also are becoming more popular, adding to the long-range potential of decreasing accidents through instruction.

Mr. Clark, who directs the driver education work and award program of the Association's accident prevention department, also urges that greater attention be given to teen-age safety conferences at local and state levels. Such meetings must be held on a *down-to-earth* scale, and they must be developed so that communities will soon hold safety conferences *"of, by, and for teenagers."*

PROBLEMS AND PROJECTS

TWO-TIER SERVER

PETER G. POLOWNIAK
Industrial Arts Teacher
Passaic, N. J.

The server shown in Figures 1 and 2 is a simple project that can be made in a very short time. It is a good fill-in project which could be fitted into the last few days of a closing shop term. It makes a rather attractive and useful server around the home.

To make this server you need two shallow plates or two deep dishes. The one illustrated is made of a 6-in. salad plate and a 10-in. dinner plate. The holes in the center of each plate were made with a ¼-in. carboloy drill such as is used in drilling holes in plate glass. Drill on a drill press using low speed. Load a 1-in. paint brush with turpentine and hold it against the drill bit while drilling. Feed the drill slowly. You will notice that the top end, *A*, Figure 1, is turned to fit through the hole in the 6-in. salad plate, and into the lower part — *B*, Figure 1. A good liquid resin glue and a snug fit will hold the pieces firmly together. The bottom end of turning *B* is turned to fit through the hole in the 10-in.

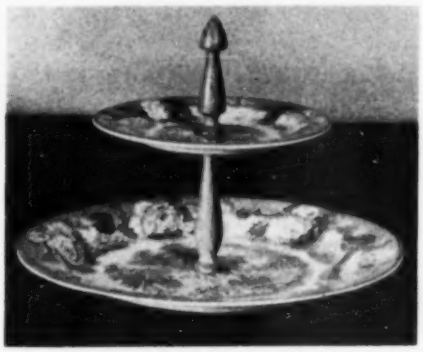


Fig. 2. An interesting two-tier server

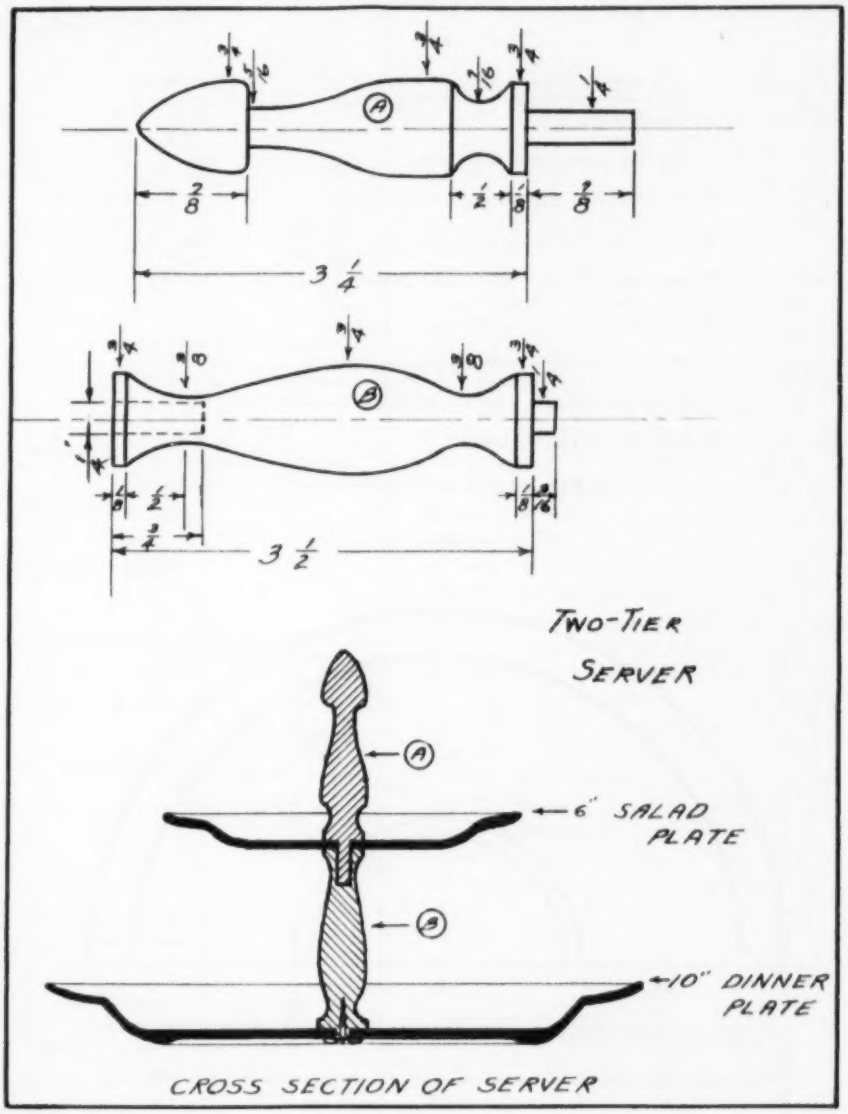


Fig. 1. Details of two-tier server

plate. This end is held to the plate with a finishing washer, and a No. 8 by 1-in. brass or nickel plated wood screw, and liquid resin glue. It might be well to mention that in selecting the bottom plate choose one whose bottom is not flat but has a bottom similar to the 10-in. plate illustrated in cross section in Figure 1. Most plates and dishes have this kind of a bottom.

Both parts of the wood spindle should be finished before assembling. A varnish finish is recommended.

SNACK TRAY

HAROLD O. AKESON
East Orange High School
East Orange, N. J.

The snack tray makes a very desirable project for several reasons. It is a good job for simple faceplate turning. As a gift it is very practical and good looking. It also embodies an economical feature in that it uses up old desk tops which have become a problem in many of the school departments since modernization of schoolroom furniture. If none of those are available there is always the possibility of old table tops, table leaves, or other discarded pieces of furniture around the student's home that could be used for this project and be of utilitarian value. The material surely would be well seasoned. Parents would be very co-operative in use of such material. Of course, if none of the foregoing sources are available the last resort would be to use the wood from the shop lumber rack.

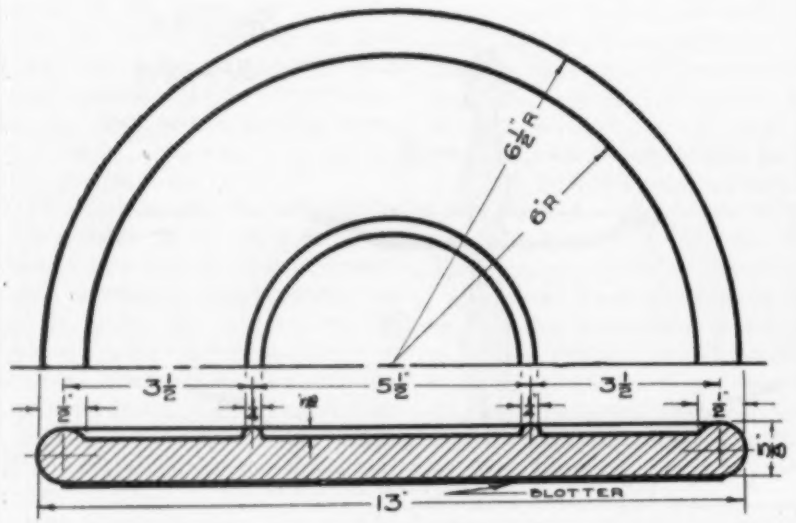
For shops without a lathe, make the tray six sided with the raised edges of ¼-in. matching material, glued and bradded in place. The

SNACK TRAY

By

Harold O. Akeson

1. Select a piece of maple, birch, or cherry, ½" x 13½ x 13¾". If unable to obtain one wide board, two narrow widths should be glued up to meet required size.
2. Plane the selected piece to thickness.
3. With dividers or compass draw a 13½" circle.
4. Cut out the circle on the band saw.
5. Mount on a face plate using screws as short as possible.
6. Rough out the shape to 13¼".
7. Turn to the required shape and diameter.
8. Sandpaper, first using a coarse and then a fine grade.
9. Polish and wax on the lathe.
10. Remove face plate and glue a circular piece of blotter on the back.



Snack tray designed by Harold Akeson

six-sided effect will be just as good and even a little unusual.

Any kind of wood will do, even pine, if an enameled finish is desired, but walnut, maple, birch, or cherry will make the nicest trays and may be finished for a natural effect.

Industrial injury rates for last year, released by the Council in advance of the 1953 edition of its annual statistical yearbook, *Accident Facts*, show a substantial reduction both frequency and severity of 1952 accidents as compared with 1951.

ALUMINUM GARDEN TROWEL

IRA H. JOHNSON

State Teachers College

Mankato, Minn.

Have you ever discovered that a favorite project is capable of being improved through better design? Then you will be interested in seeing how this *old timer*, the garden trowel, has been redesigned to be more functional and to include more of what we call *industrial arts*.

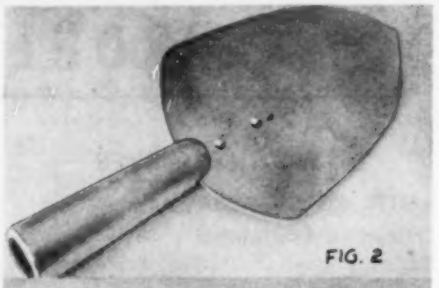


FIG. 2

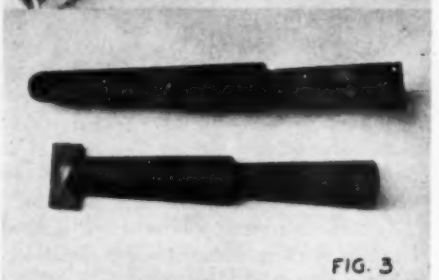


FIG. 3

FIG. 4

Fig. 2. Finished garden trowel. Note the hollow handle and the recess into which the blade fits

Fig. 3. Wood two-part pattern for the garden trowel handle

Fig. 4. (From left to right) metal insert, one half of the core box, other half of the core box, baked core, and tapered wood spindle

Fig. 5. Drag part of sand mold for the garden trowel with metal insert and sand core in place

The drawings and photographs indicate the dimensions and structural design. Aluminum is used throughout because of its conveniently *low* melting point, ease of working, and corrosion resistance.

The *blade* is constructed of $\frac{3}{32}$-in. 24ST aluminum with the *grain* running lengthwise. After cutting and filing to shape, the two $\frac{1}{8}$-in. holes are drilled and it is curved over

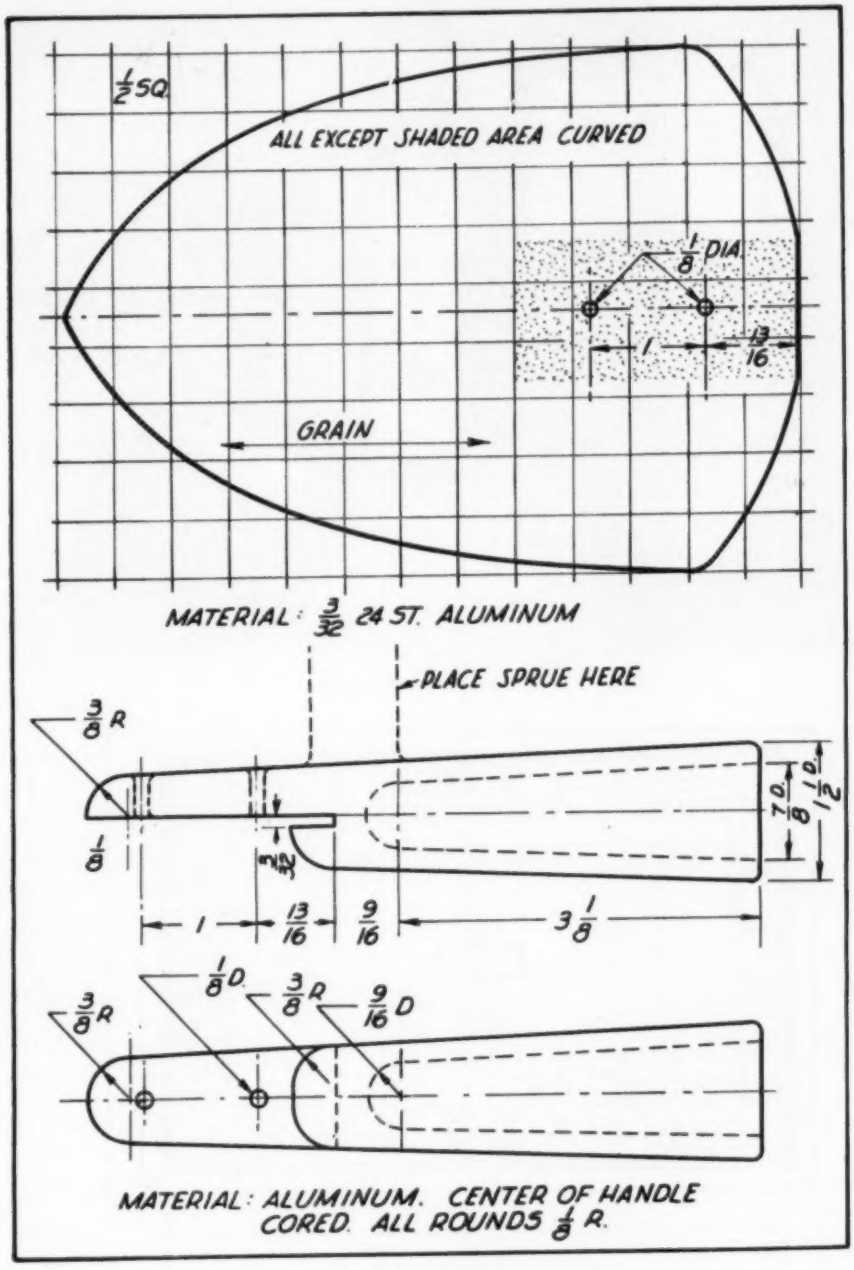


Fig. 1. Details of garden trowel

a stake or preferably in the slip forming rolls. A small area, shown in Figure 1, is flattened to a good fit for the handle.

The *handle* is aluminum cast in a sand mold with the center cored. A wooden, two part, pattern; a metal insert (later removed); and a core box for making a sand core are necessary for this operation. See Figures 3 and 4. The pattern was constructed of two pieces of mahogany, glued together with a sheet of wrapping paper in the glue joint. After turning to shape, the wrapping paper permitted an easy separation of the two parts. One piece of the two identical pattern parts was cut off, shaped and rabbeted $\frac{3}{32}$ in. deep for the cross piece. A $\frac{3}{32}$ by $\frac{3}{4}$ by $1\frac{1}{2}$-in. piece of mahogany was glued in place. The future positioning of the two pattern parts is assured by the use of two $\frac{1}{8}$-in. metal dowels as shown. The core box was carefully laid out on two pieces of pine — the future positioning of the two pieces being determined by the dowels and mating holes. After partially carving the cavity, approaching 50 per cent in each piece, it was finished to the desired shape with a tapered wood spindle made to the exact shape of the core and covered with sandpaper.

The *core* is fabricated from specially treated molding sand. Mix the core sand thoroughly and in small quantities as it *spoils* if kept very long.*

Dust the inside of the core box with parting compound and clamp the two parts securely together. Pack core sand into the cavity, remove the clamp, stand the core box open end down, and tap gently. Remove the core box, place the *green* core in an oven, and bake at approximately 400 degrees Fahrenheit for four hours.

The *sand mold* is made by placing one half of the pattern, the part with cross piece, flat side down on the molding board, surround it with the drag part of the flask, dust with parting compound, riddle sufficient molding sand to cover the pattern, and ram the rest full of molding sand. Turn the filled drag over, add the other half of the pattern and the cope part of the flask. Dust the entire sand and pattern surfaces with parting compound, riddle sufficient molding sand to cover the pattern, and ram the rest full of molding sand. Separate the cope and the drag, moisten the area around the pattern, and carefully remove the two pattern parts. Cut the sprue, as indicated by hidden lines in the drawing, and place the sand core and metal insert in their proper places. See Figure 5. Replace the cope on the drag. Melt a sufficient quantity of aluminum and pour. After a cooling period separate the cope and the drag, remove and discard the sand core, remove and save the metal insert, cut off the sprue and file the area where it was attached to shape. Drill the holes in the handle, countersinking them on the bottom side, and rivet the blade and handle together with $\frac{1}{8}$-in. round head aluminum rivets.

Polishing of the handle and blade was thought to be unnecessary and even undesirable since this is a project that is designed to serve a functional purpose, useful in industrial-arts instruction and also when taken home.

*The following ingredients in the proportions indicated will provide a satisfactory core sand: white sand — 280 pounds, core oil — 2¼ quarts, Mogol binder — 2 pounds, and kerosene — 1 pint.

An airplane hangar that can be driven at 35 miles an hour around the airfield is in the planning stage in North Carolina. Powered by oil in the form of a giant diesel traction unit, the mobile hangar will be designed in two sections which can pull apart, leaving planes free for a quick take-off. To speed American planes in their tasks, oil provides not only fuel and lubricants but also asphalt for airfield runways. — *Petroleum Newsnotes*

ACHIEVEMENT PLAQUES OR TROPHIES

CHARLES H. MIECZNIKOWSKI
Sloan Public Schools
Union Free School District No. 9
Town of Cheektowaga
Buffalo, N. Y.

Nearly every school shop has the opportunity to contribute its efforts and *know-how* in helping to make something for a special occasion. This can be done by having the shop students make trophies or plaques for presentation for special achievements. These projects can be individualized by having the shop or mechanical drawing pupils make appropriate designs, which though simple, may, nevertheless, be quite professional looking. There are no complicated joints to be fitted, nor need expensive materials be used.

The trophy and the plaques shown in the illustration have been made in our woodworking shop. They were made from short pieces of stock. The trophy is made out of maple and walnut wood. The name plate is made of brass with the lettering painted on.

The plaques are made of cherrywood, stained with mahogany stain. The interesting feature about these plaques is the fact that we have cut a piece of clear plastic, to fit the contours of the design and attached it to the wood plaque with escutcheon pins or small brass round head wood screws. We chamfered the edges on the shield plaques, and cut a decorative groove with a circular saw on the rectangular ones.

Various pictures, insignias, medals, posters, nameplates can be easily placed behind the plastic plates.

The illustration shows representative pieces. Many different designs may be made.

Achievement trophies

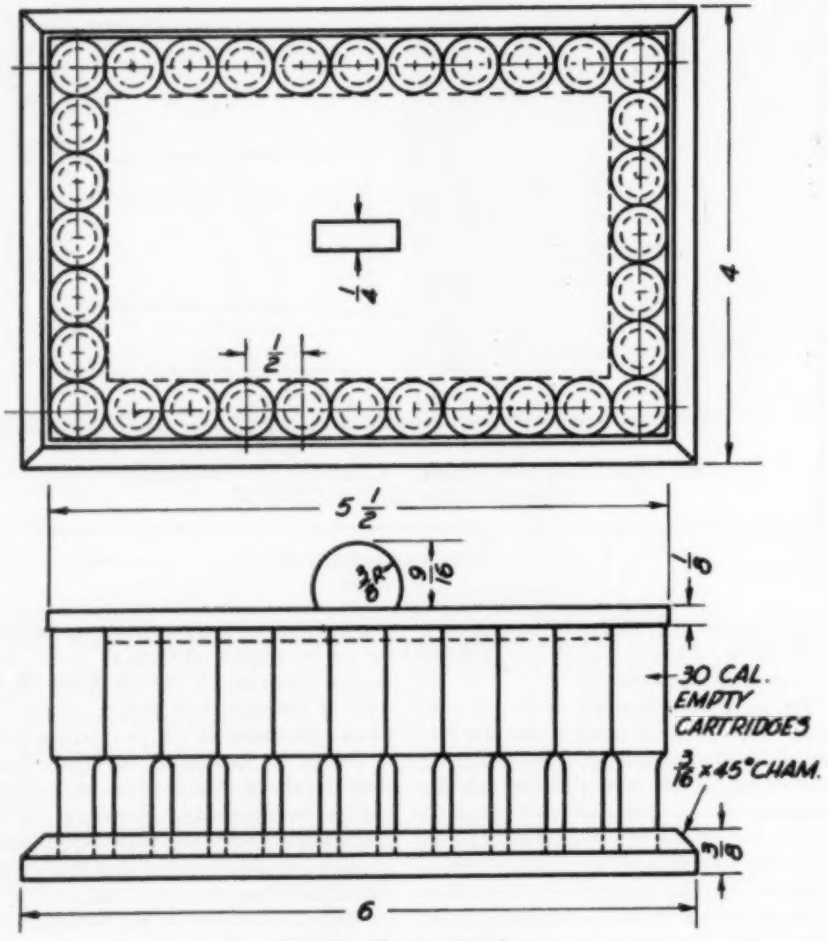
PLASTIC CIGARETTE BOX

C. H. CONNALLY
Industrial Education Department
East Texas State Teachers College
Commerce, Tex.

The combination of brass shell cases and pieces of plastic make a very novel and attractive project. The instructions for making it are as follows:

1. Select a piece of black plastic $\frac{3}{8}$ in. thick for the base. Leave the masking tape on the surface and mark it off 4 by 6 in. Cut this out with a bench saw or band saw leaving $\frac{1}{16}$ in. on the outside of the line.

2. Plane, file, or sand the base to the exact size.



Details of cigarette box

3. Mark lines on top surface of the base ½ in. from each edge.

4. Set dividers at ½ in., and step off 32 points on this inside line around the base. Begin at one corner for this.

5. Use prick punch and punch each point to be drilled.

6. Use a 3/32-in. pilot drill and drill holes at each punch mark 3/16 in. deep.

7. Select a 7/32-in. drill bit and drill these holes larger but to the same depth.

8. Lay out a 3/16-in. chamfer around the edge of the base with a marking gauge.

9. Secure plastic in a vise and cut the chamfer around the edge of the base with a plane.

10. Polish the edge of the base on the buffing wheel.

11. Polish the shell cases on the buffing wheel, and apply a coat of clear lacquer to each.

12. Apply a few drops of household cement in each hole of the base and force a shell case to the bottom of each hole.

13. Cut a piece of clear plastic ⅛ by 2½ by 4½ in., and sand edges smooth. This is the inner top piece.

14. Cut a piece of clear plastic ⅛ by 3½ by 5½ in., and sand edges smooth. This is the outer top piece.

15. Polish edges of both pieces.

16. Cement the two pieces together so that the smaller piece is equal distance from each edge of the larger piece. Use ethylene dichloride or acetone as the bonding agent for Plexiglas.

17. Cut plastic knob of black plastic ¼ by 9/16 by ¾ in., and polish edges.

18. Cement knob to box lid.

19. Apply coat of wax to plastic and polish with a clean soft rag.

20. If desired, a liner of clear plastic 1/16 in. thick, 1⅝ in. high and long enough to be shaped around the inside of the box, may be added. Warm the plastic and bend at right angles for the corners. Slip this in place inside the box.

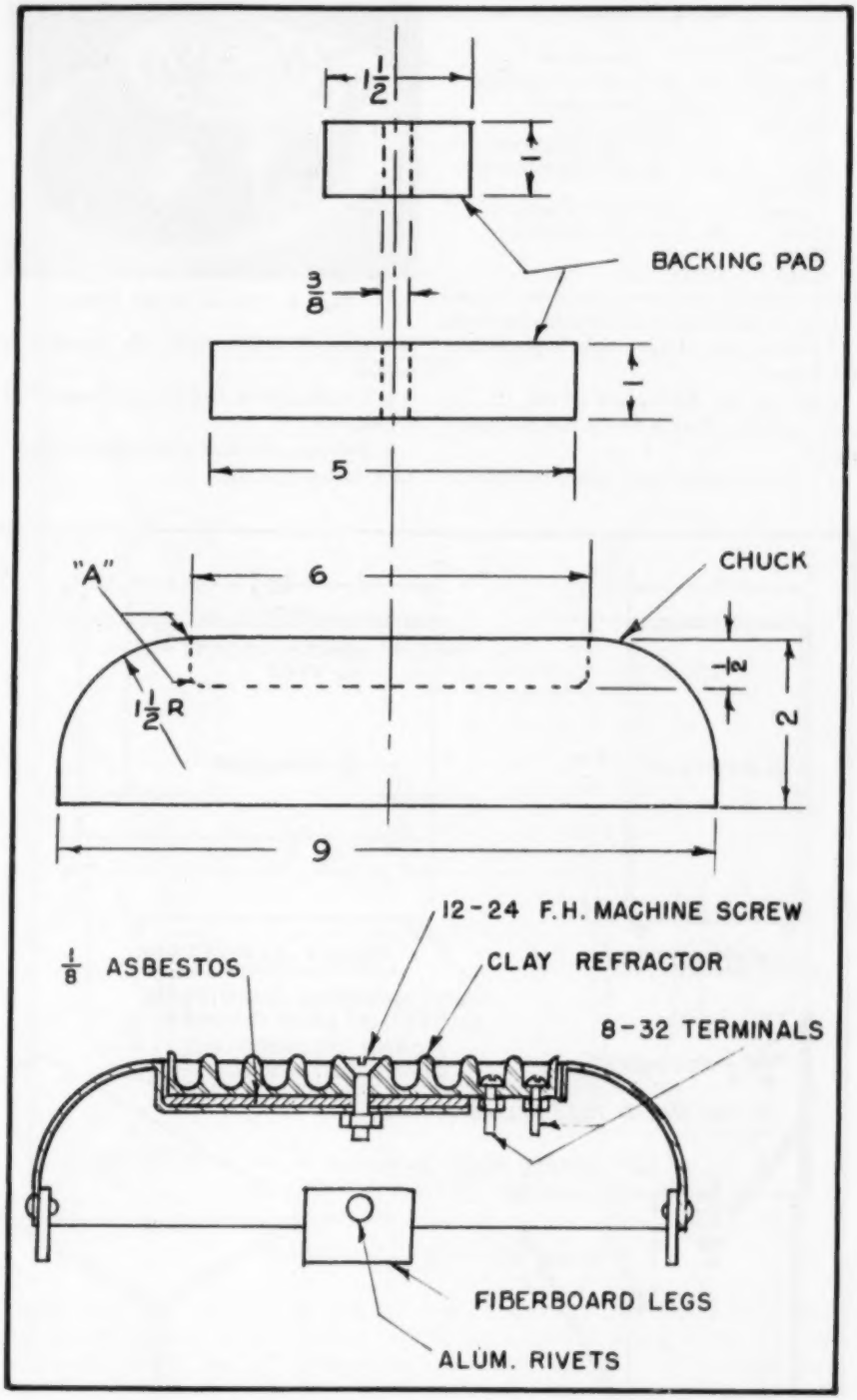


Fig. 1. Details of chuck and hot plate assembly

SPUN ALUMINUM HOT PLATE

L. B. HARDEMAN
Assistant Professor of Industrial Education
A. & M. College of Texas
College Station, Tex.

Construction of this spun aluminum hot plate may lessen the problem of what to have the student make to round out his learning experiences. Often it is hard to make a project that will illustrate visually the theory of resistance in an electric heating device. One advantage of a hot plate like this is that the construction of the base will require only a wood lathe which is usually found available in the school shop. Because there is a minimum of time involved in spinning the base, this project proves practical even in a class of electricity.

The nichrome wire element can be obtained by two methods. More experience can be afforded by figuring the resistance required and winding the element, or if desired, a ready wound refractor unit may be purchased and fitted into the spun base. (The refractors may be purchased from the Hartford Element Company, Hartford, Conn.)

The following steps suggest an efficient and easily followed plan of procedure.

BILL OF MATERIAL

No. Req.	Item	Description
1	Base (disk)	10 in. dia. — .064 soft aluminum
1	Insulation	7 in. dia. x ⅛-in. asbestos
1	Refractor	5¾ in. dia. ceramic
1	Wire	No. 22 x 19 ft. x 6-in. nichrome wire
1	Bolt	No. 12–24 x 1 in. f.h. machine screw
2	Machine screw	No. 8–32 x ¾ in. r.h. brass
1	Cord	No. 16 by 6 ft. appliance cord
1	Plug	2 prong
1	Bushing	Hard rubber

1. Select hardwood stock for spinning chuck and backing pads. Hard maple is preferable. See Figure 1.

2. Fasten the chuck stock securely to the lathe faceplate. Turn it to the size and shape shown.

3. Cut out backing pads, shown in Figure 1.

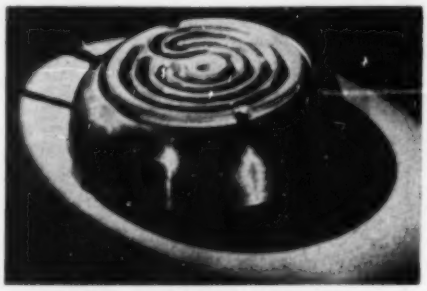


Fig. 2. Finished hot plate

One each of 1½-in., and 5-in. diameter is needed.

4. Cut one disk of .064 soft aluminum 10 in. in diameter.

5. Lubricate the disk with beeswax, tallow, soap, or heavy grease.

6. Center the disk on the chuck using the 1½-in. backing pad to hold it in position.

NOTE: In order to spin the "sunken" area for the heating element, it will be necessary to take up the slack by turning the tailstock handwheel continuously while spinning.

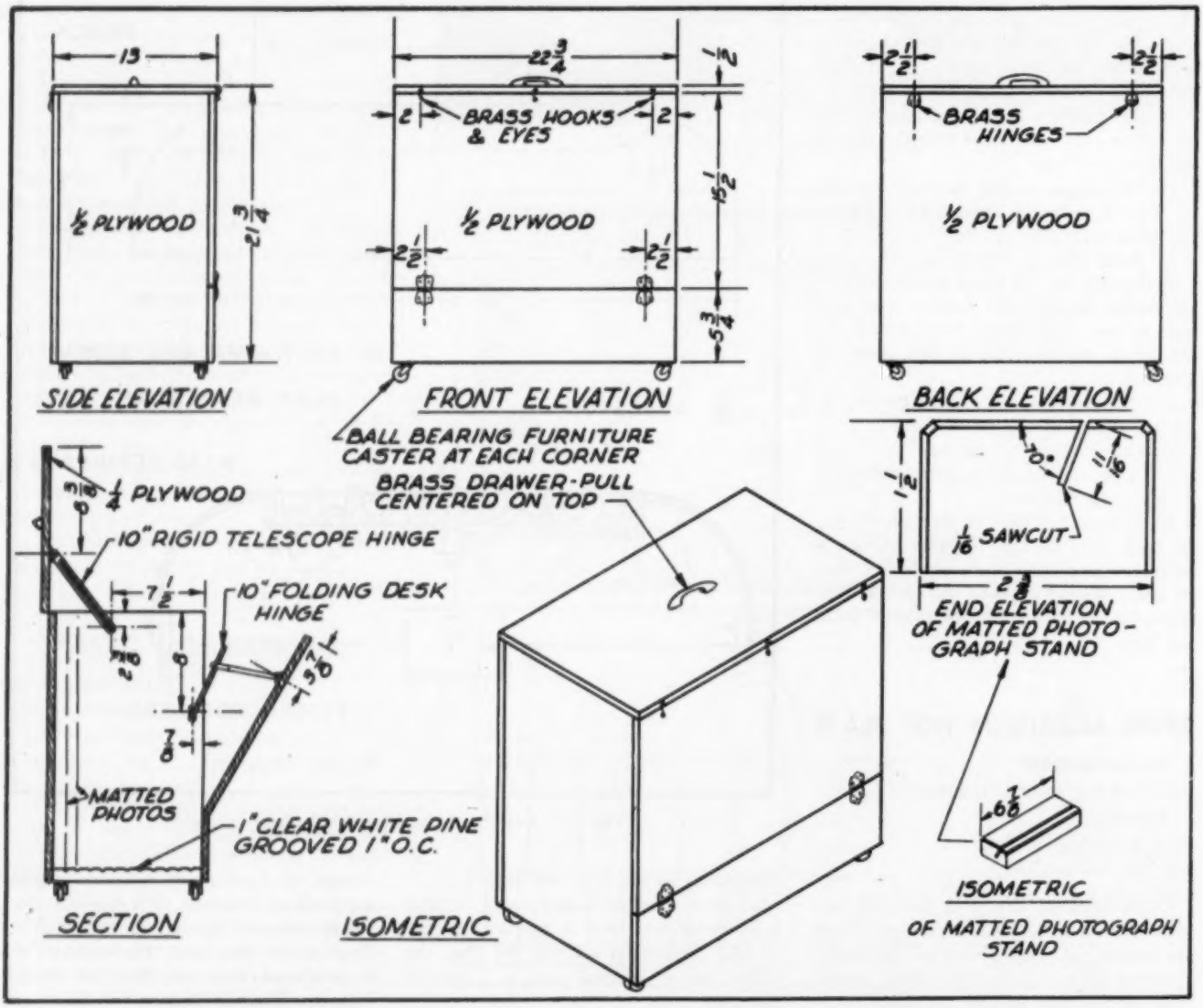
CAUTION: Do not stretch aluminum too much at the corners. See radius at *A* in Figure 1.

7. Remove the 1½-in. backing pad and insert the 5-in. size.

8. Continue the spinning around outside contour of the chuck.

9. Sand the surface with 3/0 sandpaper which has been coated generously with lubricant. This will give a satin finish.

10. Remove the spinning from the lathe. Drill hole for element, also hole for binding



Details of cabinet for filing large matted photographs to be used for preserving class situations, teaching techniques, etc. Submitted by Robert R. Morrow, superintendent, public schools, Tucson, Ariz.

post. Drill and tap hole for cord bushing. Tap ⅛-in. standard pipe thread.

11. Cut ⅛-in. thick asbestos disk to a diameter to fit the hot plate base.

12. Use No. 22 by 19 ft. by 6-in. nichrome wire. Wind it continuously on ⅛-in. welding rod.

13. Stretch the nichrome winding for a distance of 30 in., and insert into the refractor using two No. 8–32 by ¾-in. r.h. brass machine screws.

14. Assemble the heating element into spun base with a No. 12–24 by 1-in. f.h. brass machine screw.

15. Connect appliance cord to the element terminals and attach to prong plug.

16. Test project and particularly the element to determine if the correct wattage is being consumed.

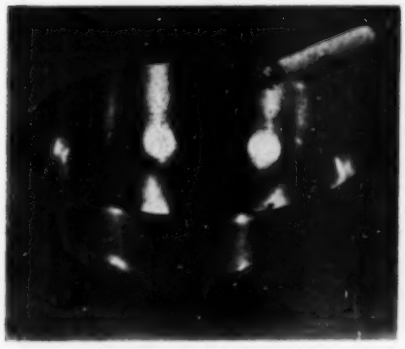
17. Recheck all connections after the first heating.

A MODERN ASH TRAY

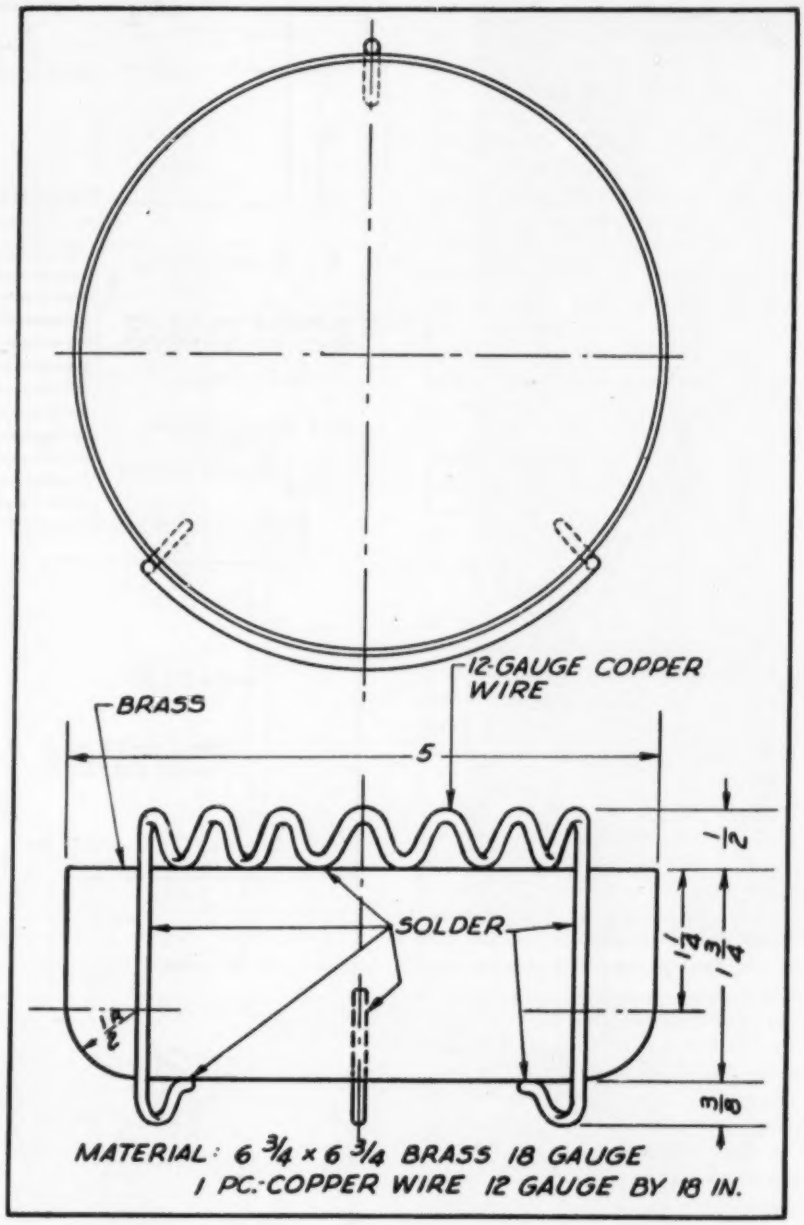
WILLIAM D. CHATFIELD
Assistant Professor of Industrial Arts
and
HERBERT D. WELTE, JR.
Student, Teachers College of Connecticut
New Britain, Conn.

Through the construction of the modern ash tray described herewith, the student develops skill in wood turning, metal spinning, soft soldering, and metal finishing. Other designs can be experimented with for choice and certainty as to the shape of the finished job.

As soon as the design has been decided, the chuck is the next undertaking. The chuck is the wooden form around which the metal is shaped while the lathe is operating. It should be made of a hard wood, such as maple, cherry, or birch. Actually maple is superior as it has less compressibility than most other woods. The wood is prepared so that it can be placed on the lathe for shaping, the same as in wood turning. There are three different methods of securing the wood to the lathe; one is the faceplate method, the second requires that a tap hole be bored into the wood so that it may be threaded on the drive spindle of the lathe. The third is to gouge out the wood and hold an arbor in the gouged section and pour molten metal around the arbor, remove the arbor when the metal is cool and screw this unit onto the drive spindle. The arbor, of course, must be the same size as the threaded drive spindle of the lathe. Follow the working plan and reduce the chuck to the predesigned shape, sand, and burnish. Burnishing is done to harden the surface of the wood and alleviate grain marks.



Spun metal ash tray



Details of the modern ash tray

A follow block is used to hold the metal disk against the chuck. This follow block should be equal in diameter to the flat bottom section of the chuck and is placed on a revolving center in the tail stock of the lathe.

To determine the diameter of the metal needed, add the largest diameter of the finished piece to the height of the object. The stretching of the metal will make up the difference and this formula will give desired results. Cut out the metal disk. The metal may be aluminum (not readily solderable), copper, brass, or sterling silver. The thickness of the metal can vary from about 18 gauge to 20 gauge. The thicker it is the better as the top has no bead.

The actual spinning operation is the next event; place the metal in position, center and tighten the tail stock to hold the metal in secure position. With a round tool, spin the metal that has been lubricated with spinning lubricant or yellow soap. The lubricating preserves the metal and limits friction. After spinning for a few minutes, the metal becomes hard, necessitating annealing. For copper or brass the metal can be heated to a red heat and immersed in water for the annealing process. After the annealing, pickle the metal as the oxide is as hard as the metal and the oxide spots will be pressed into the metal during the spinning operation. To anneal aluminum, heat until a pine piece chars on the metal and immerse in water.

It might be well to mention two or three safety factors that must be observed. During the turning of the wood, it is wise to wear an eye shield; while spinning wear an eye shield, and use tongs to handle the heated metal. Be constantly alert to safety.

Complete the spinning and finishing as far as the lathe is concerned. Emery and steel wool are good abrasives for the finishing. The piece can be reversed with the bottom placed against the chuck and the follow block will hold piece secure. Polish the inside of the spun object.

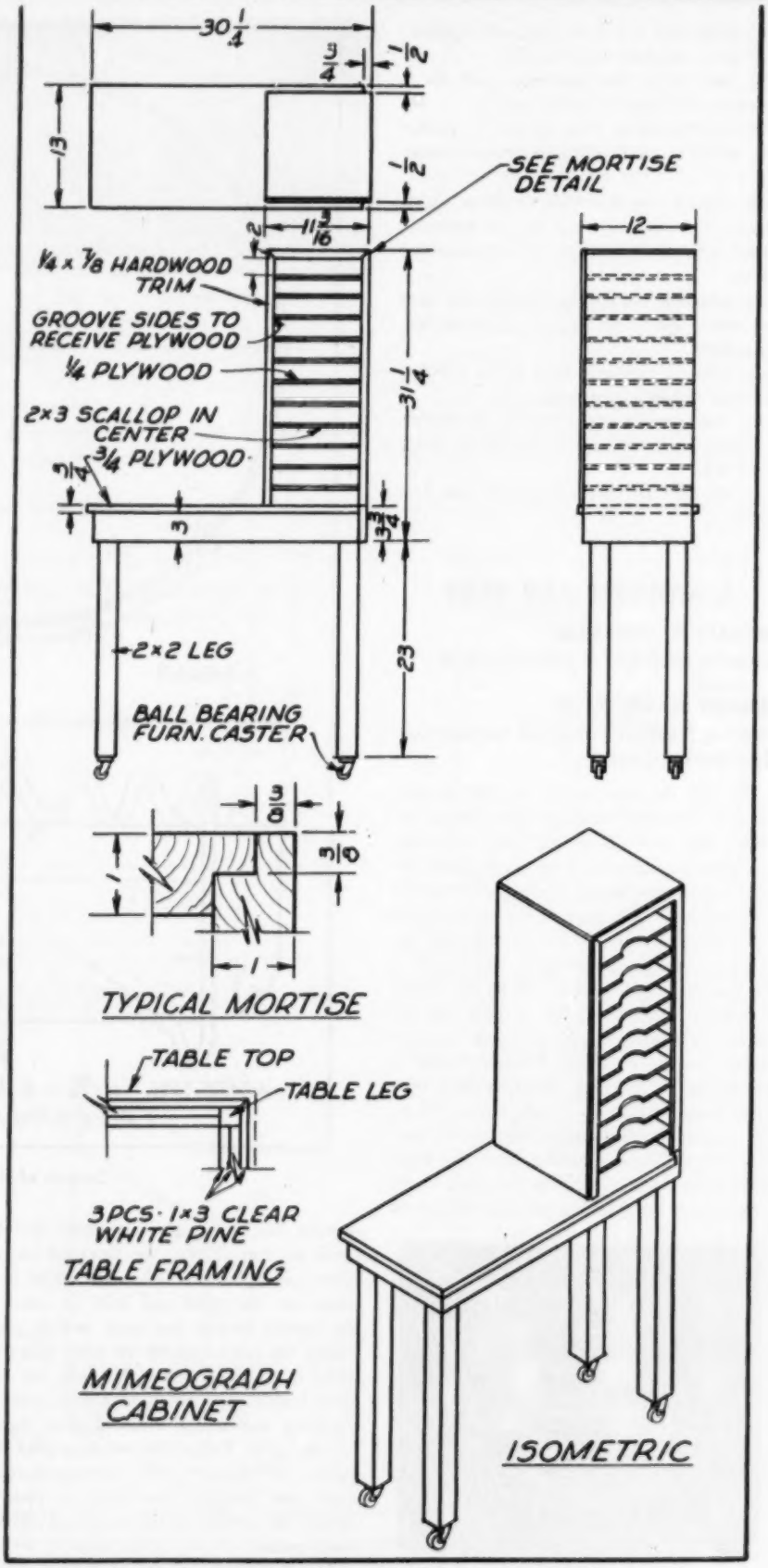
The design of the legs and the form or shape of the cigarette holders are very important. It is first necessary to make a template to follow when bending the wire, or a jig can be made to comply with the design and facilitate the construction of this part of the job. The wire for legs and holders can be copper as we are making a brass base. A number twelve copper wire will work satisfactorily and it can be soldered with ease. Bend the wire to shape and check for fit on the bowl. If the fit is all right, buff the brass with the tripoli and rouge wheels. The chuck can be placed in the piece to aid in buffing.

Cotter pins may be used to hold the legs in position while the soldering is being done. Cut small bits of solder and use a torch to do the soldering. Appropriate flux helps. Clay may be used to protect soldered joints already completed.

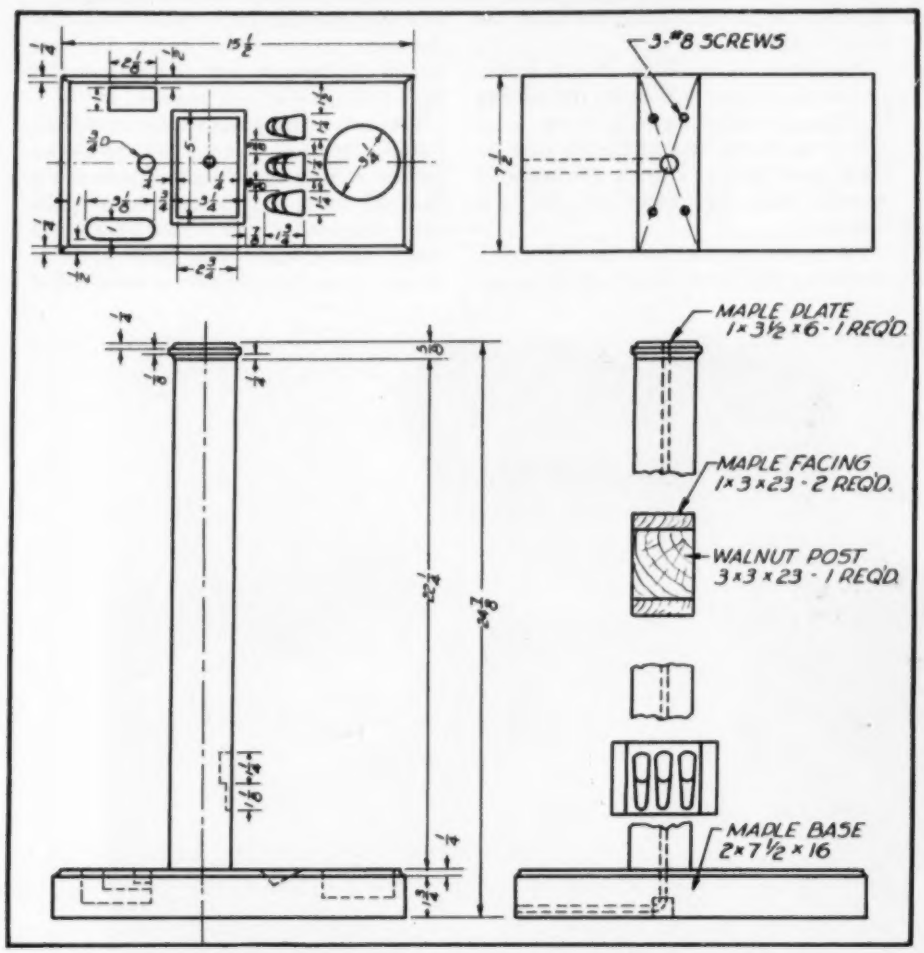
Following the soldering, use a metal polish on the brass and flat black paint the copper. A burn-proof lacquer can be used over the brass to protect the high gloss.

This is an excellent project to develop interest in metal spinning and industrial-arts education.

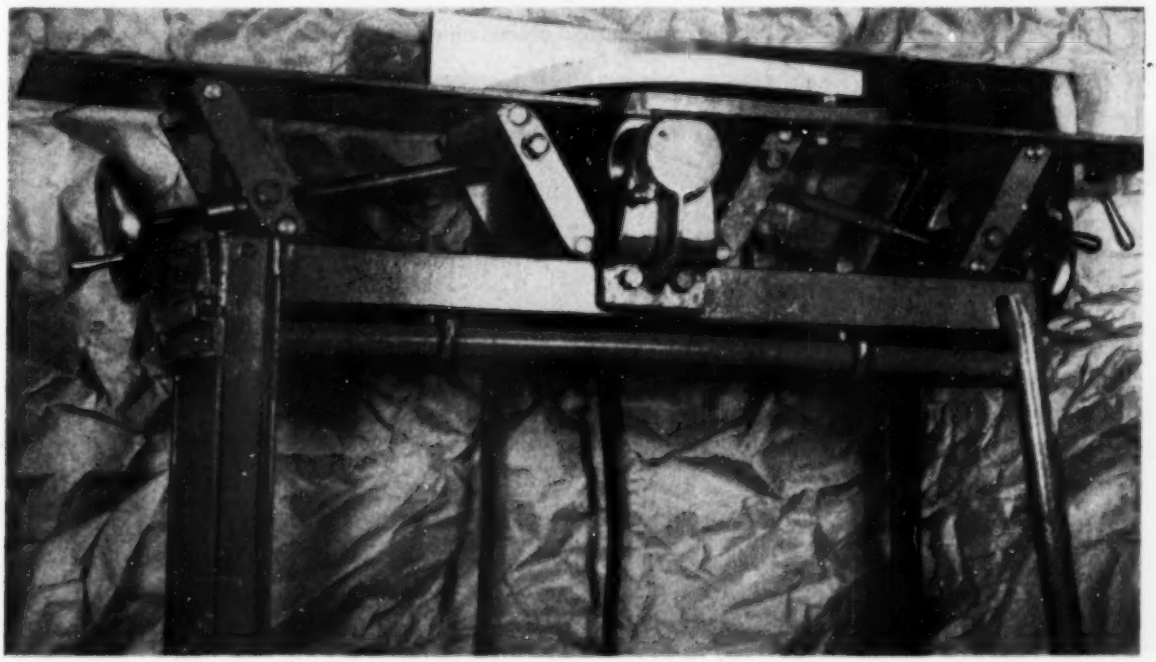
Because the United States always has enjoyed the largest and cheapest supply of petroleum in the world, it has adopted the automobile and airplane to a degree not matched elsewhere. — *Petroleum Newsnotes.*



Details of cabinet and binding table for mimeographed material by Robert D. Morrow, superintendent, public schools, Tucson, Ariz.



Details of armchair lamp designed by John Murphy, Roosevelt High School, Des Moines, Iowa



Assembled jointer (see next page)

SIX-INCH WOOD JOINTER

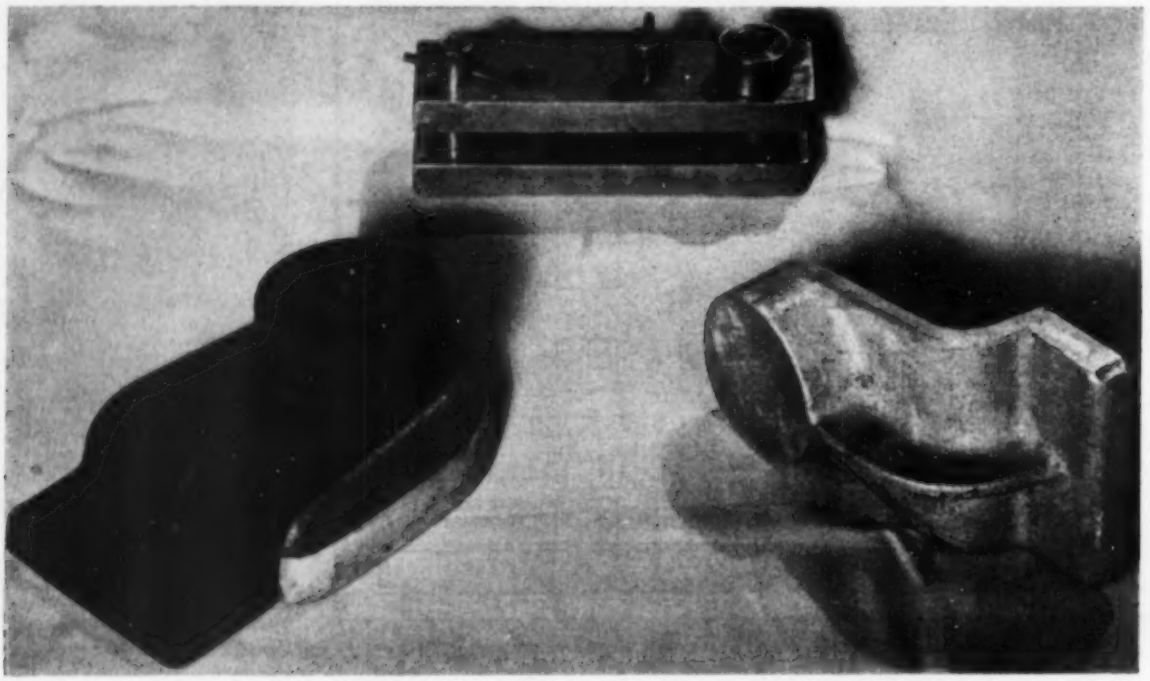
LT. E. W. DIEHL, U.S.N.
U. S. Naval Ordnance Missile Test Facility
White Sands Proving Ground
Las Cruces, N. Mex.

The 6-inch jointer shown in the accompanying illustrations represents a suitable project for vocational students, particularly those who are interested in constructing machinery for home workshops.

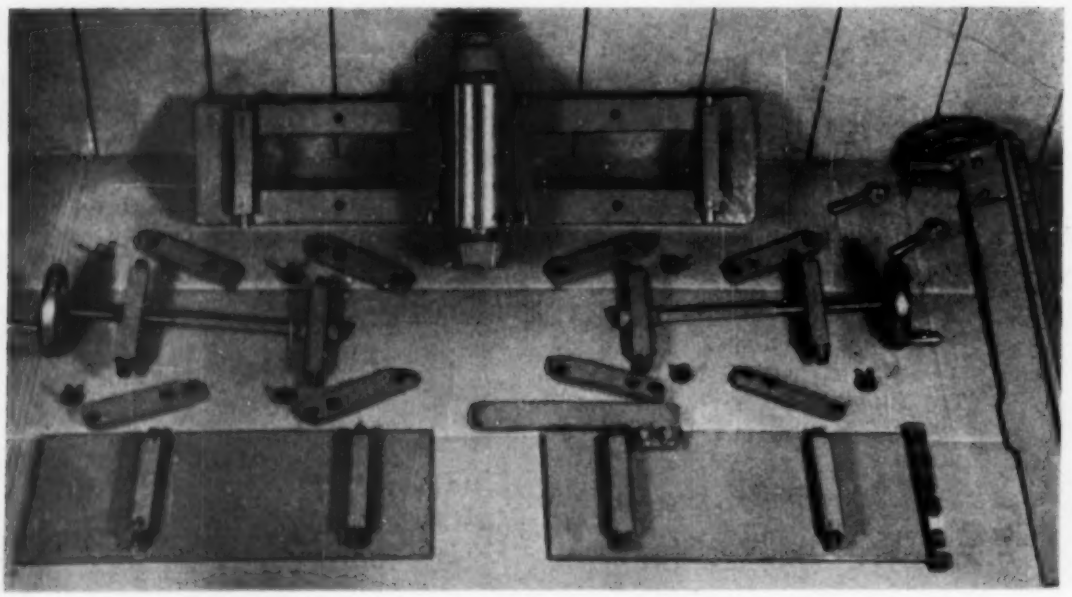
The jointer is unusual in that it utilizes a trapezoid as a means of raising and lowering the tables, to control the depth of the cut, as well as moving the table forward to close the throat over the cutter head. The assembly drawing shows the action of the table movement.

The project provides some practice in patternmaking and simple foundry work to produce the bearing brackets which were cast of aluminum in the model shown. Increased scarcity of aluminum may necessitate having the brackets cast of iron, however.

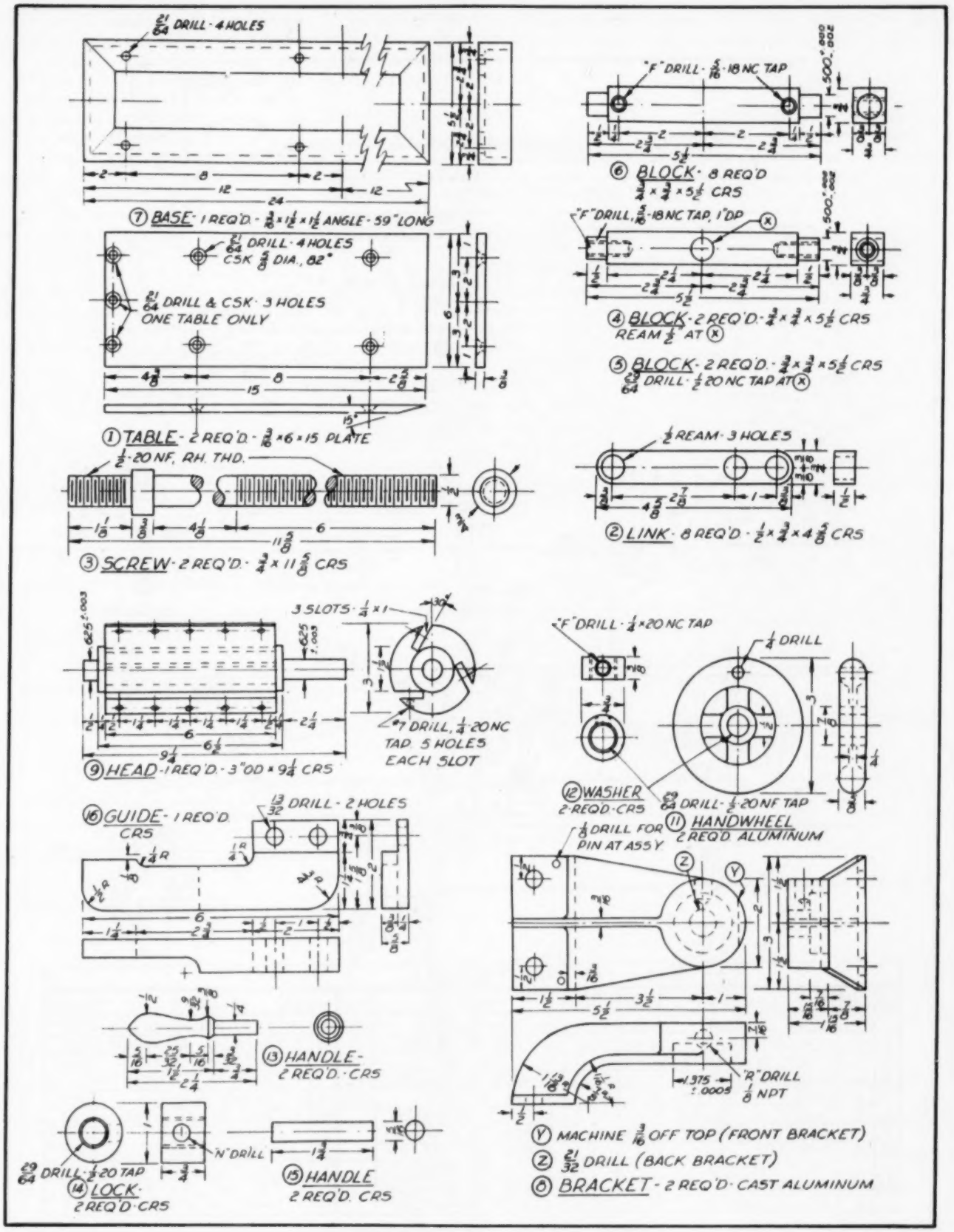
The parts of the project which require the greatest degree of accuracy are the blocks, position of holes for bolting the blocks to the base and tables, and the three holes in the links. The bearing ends of the blocks were tested with a simple ring gauge made by reaming a piece of mild steel or using one of



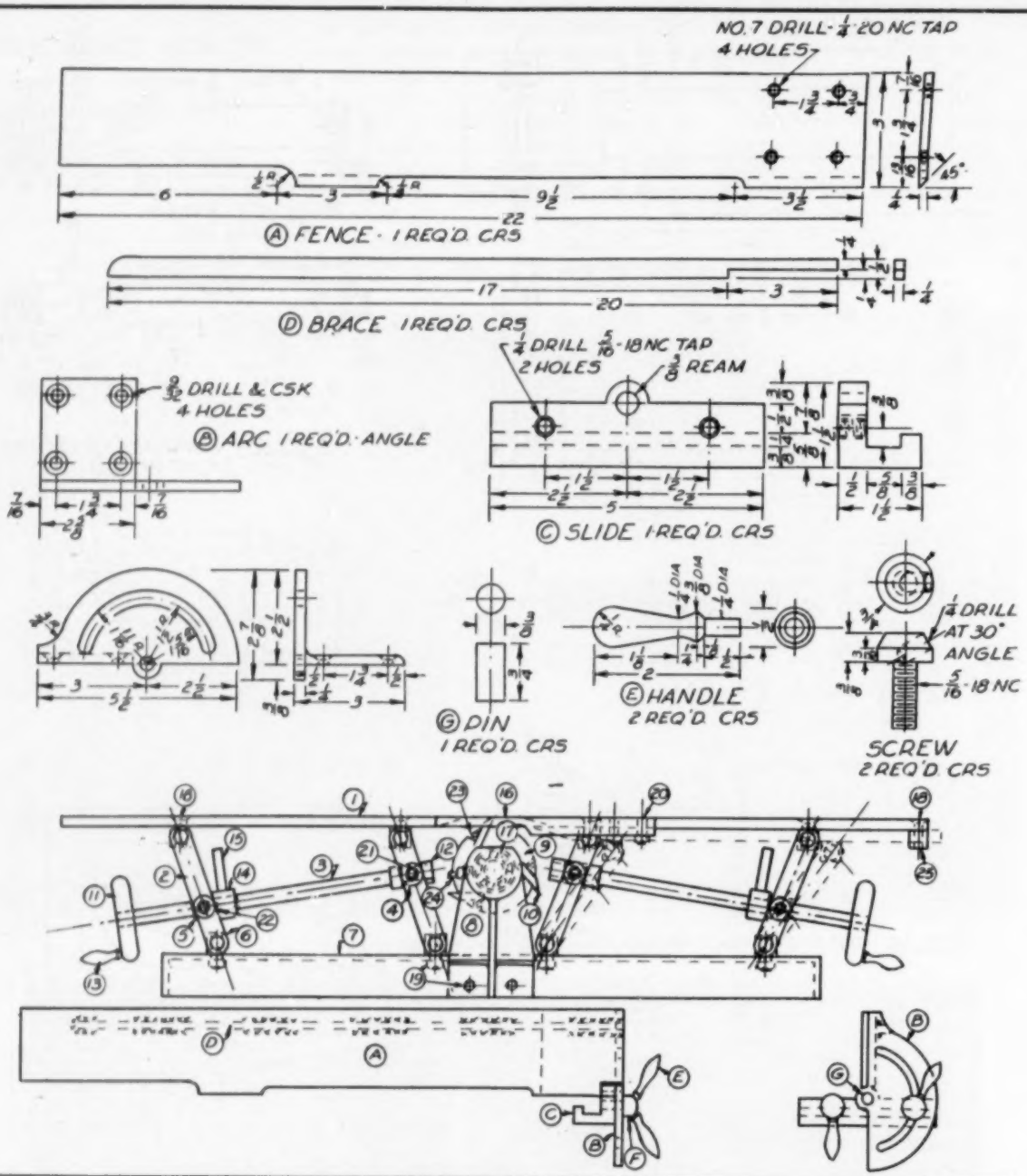
Drill jig, pattern, and aluminum casting



Jointer head, links, and blocks


21/64 DRILL - 4 HOLES
⑦ BASE - 1 REQ'D. - 3/16 x 1 1/2 x 1 1/2 ANGLE - 59" LONG
21/64 DRILL - 4 HOLES CSK 3/8 DIA., 82°
21/64 DRILL & CSK - 3 HOLES ONE TABLE ONLY
① TABLE - 2 REQ'D. - 3/16 x 6 x 15 PLATE
1/2 - 20 NF, RH. THD.
③ SCREW - 2 REQ'D. - 3/4 x 11 5/8 CRS
"F" DRILL - 5/16 - 18 NC TAP
⑥ BLOCK - 8 REQ'D 3/4 x 3/4 x 5 1/2 CRS
"F" DRILL, 5/16 - 18 NC TAP, 1" DP
④ BLOCK - 2 REQ'D. - 3/4 x 3/4 x 5 1/2 CRS REAM 1/2 AT (X)
⑤ BLOCK - 2 REQ'D. - 3/4 x 3/4 x 5 1/2 CRS
21/64 DRILL - 1/2 20 NC TAP AT (X)
1/2 REAM - 3 HOLES
② LINK - 8 REQ'D - 1/2 x 3/4 x 4 3/8 CRS
3 SLOTS - 1/4 x 1
#7 DRILL, 1/4 - 20 NC TAP 5 HOLES EACH SLOT
⑨ HEAD - 1 REQ'D. - 3" OD x 9 1/4 CRS
"F" DRILL - 1/4 x 20 NC TAP
1/4 DRILL
⑫ WASHER 2 REQ'D. CRS
29/64 DRILL - 1/2 - 20 NF TAP
⑪ HANDWHEEL 2 REQ'D. ALUMINUM
⑯ GUIDE - 1 REQ'D. CRS
13/32 DRILL - 2 HOLES
⑬ HANDLE - 2 REQ'D. CRS
1/8 DRILL FOR PIN AT ASSY
29/64 DRILL - 1/2 20 TAP
⑭ LOCK - 2 REQ'D. CRS
"N" DRILL
⑮ HANDLE 2 REQ'D. CRS
"R" DRILL 1/8 NPT
(Y) MACHINE 3/16 OFF TOP (FRONT BRACKET)
(Z) 21/32 DRILL (BACK BRACKET)
⑥ BRACKET - 2 REQ'D. - CAST ALUMINUM

Details of six-inch wood jointer



BILL OF MATERIAL

NO	PCS REQ.	PART	MAT.	NO	PCS REQ.	PART	MAT.	NO	PCS REQ.	PART	MAT.
1	2	TABLE 3/4 x 6 x 15	PL	12	2	WASHER 3/4 OD x 3/8	CRS	23	15	SCREW 1/4-20 x 1/4 SAFE HD SET	
2	8	LINK 1/2 x 3/4 x 4 3/8	CRS	13	2	HANDLE 9/16 OD x 3/4	CRS	24	2	ZERK 1/8 x 45° GREASE FITT.	
3	2	SCREW 3/4 OD x 11 5/8	CRS	14	2	LOCK 1" OD x 3/4	CRS	25	1	GUIDE 5/8 x 5/8 x 7	CRS
4	2	BLOCK 3/4 x 3/4 x 5 1/2	CRS	15	2	HANDLE 5/16 OD x 1 3/4	CRS			---FENCE ASS'Y---	
5	2	BLOCK 3/4 x 3/4 x 5 1/2	CRS	16	1	GUIDE 5/8 x 2 x 8	CRS	A	1	FENCE 1/4 x 3 x 22	CRS
6	8	BLOCK 3/4 x 3/4 x 5 1/2	CRS	17	2	BEARING FAFNIR #57		B	1	ARC 1/4 x 3 x 3 x 5 1/2	ANG.
7	1	BASE 1 1/2 x 1 1/2 x 59	ANG.	18	11	SCREW 5/16 x 1 FH. MACH		C	1	SLIDE 1 1/2 x 1 1/2 x 5	CRS
8	2	BRACKET	AL	19	12	SCREW 5/16 x 1 HEX CAP		D	1	BRACE 1/4 x 1/2 x 20	CRS
9	1	HEAD 3 OD x 5/8	CRS	20	2	SCREW 5/16 x 5/8 HEX CAP		E	2	HANDLE 1/2 OD x 2	CRS
10	1 set	BLADES 1/8 x 1/16 x 6 1/8	ST.	21	8	SCREW 5/16 x 3/4 HEX CAP		F	2	SCREW 3/4 x 1 1/4	CRS
11	2	WHEEL 3 OD x 5/8	CRS	22	8	WASHER 5/16 FLAT CUT		G	1	PIN 3/8 OD x 3/4	CRS

Details and assembly of six-inch jointer

the reamed holes in the link. A close tolerance should be held here to achieve smooth operation of the parts.

A simple jig made of a piece of 1½ by 1½ by 7-in. cold-rolled steel was used to guarantee accuracy in the location of holes in the links to maintain parallelism in the sides of the trapezoid. Three holes were drilled and reamed in the jig to take a locating pin and a drill guide bushing. A slot ½ in. wide by ¾ in. deep was milled in the jig to receive the links and a hole drilled and tapped for a lock screw. In operation, one hole was drilled and reamed in each link, the link was then reversed in the jig, the locating pin slipped into the reamed hole in the jig and through the link while the second hole was drilled and reamed. The process was repeated for the third hole. By using this setup the jig could be clamped on the drill press table and not moved until all the holes in the links were drilled and reamed.

The fence is constructed of angle iron welded to a piece of flat cold-rolled steel with a stiffening brace welded to the back. Separate lock screws permit the adjustment of the fence to any angle from 45 to 90 deg. and movement of the fence across the table.

A guide is bolted to the front table to permit making tenon cuts, etc.

PIVOT-SHAPER PARALLEL

CHARLES THARRATT
Machine Shop Instructor
Cortland High School
Cortland, N. Y.

This is an ideal project for any shop equipped to do shaper work. Castings which do not have parallel sides may be held easily in the shaper vise for machining flat surfaces. Due to the pivot action of the parallel, castings or other pieces of metal which taper slightly may be held rigidly in the vise.

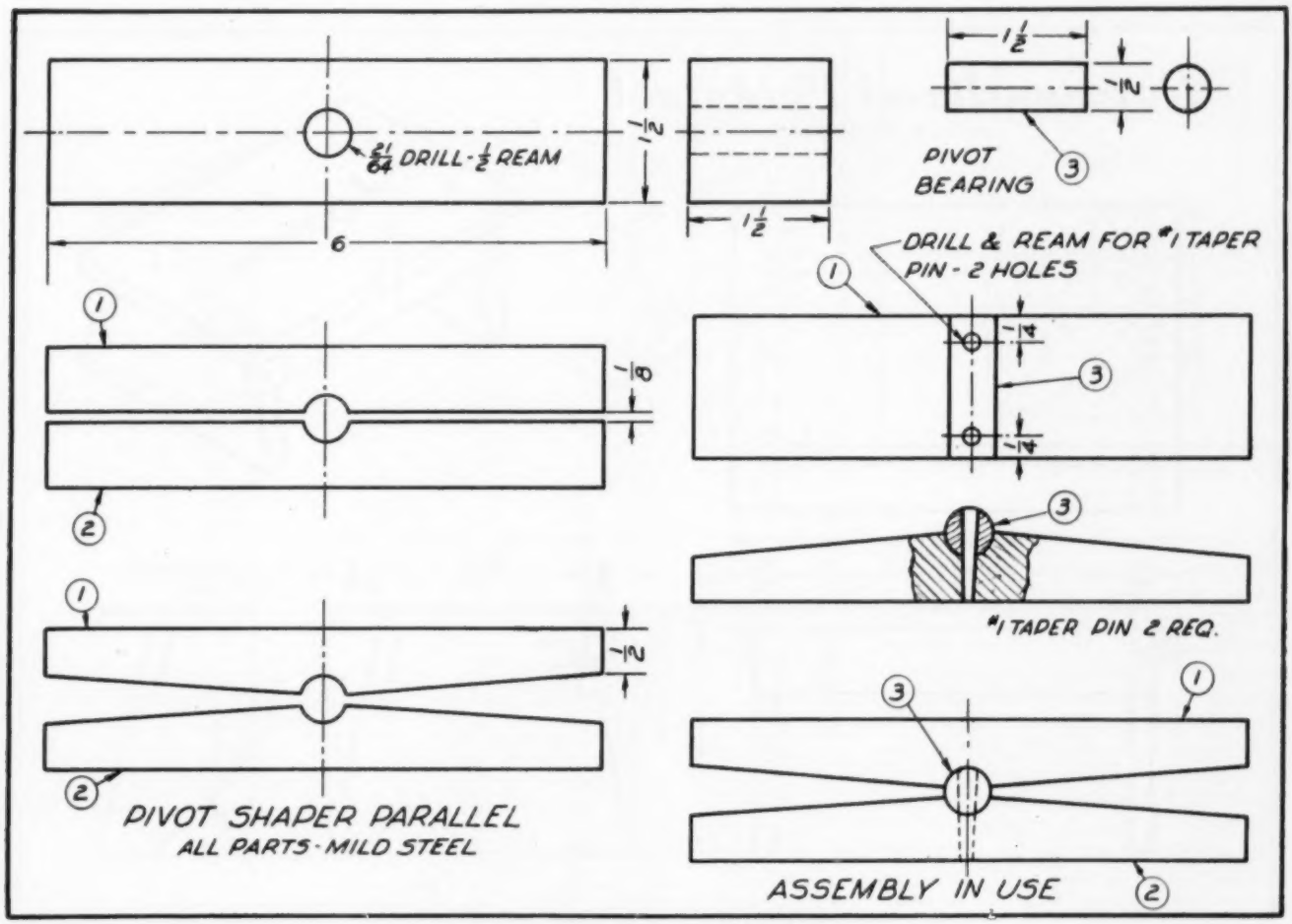
This project has been made in the Cortland High School machine shop and has been used for some time. It works very well.

As can be seen from a study of the drawing, many desirable learning situations are presented to the student who completes the project. Two of these worthy of mention are the use of the slitting saw on the milling machine and the use of standard taper pins, a subject too often missed in the school shop.

Any mild steel may be used and the dimensions may be changed to suit the size vise on the shaper or milling machine. The project may be surface ground before assembly or simply filed to remove turns and tool marks.

Operations

1. Select stock.
2. Face stock to length.
3. Lay out hole as shown.
4. Drill and ream ½-in. hole.
5. Use ⅛-in. slitting saw, cut stock in half as shown.
6. Mill or shape taper on both pieces.
7. Select stock for pivot bearing as shown.
8. Face pivot bearing to length.
9. Place pivot bearing in part No. 1.
10. Lay out location of taper pin holes.
11. Drill and ream for No. 1 taper pins.
12. Drive taper pins home.



Pivot-shaper parallel by Charles Tharratt

13. File off excess length of taper pins.
14. Remove all burrs and polish with abrasive cloth.
15. Parts No. 1 and No. 2 may be surface ground if desired.

PERSONALIZED FOOTSTOOL

HAROLD O. AKESON
High School
East Orange, N. J.

The footstool was one of the old-time manual training or shop projects. It was a standard project year in and year out. Now it has come back again in stores and it appears in gift column advertisements of home magazines.

Small children find it difficult to reach a sink. It makes washing up a novelty when they can stand on a sturdy stool and be at a convenient height to reach the soap and water. It makes them very proud when their own name is lettered on the top of the stool.

The footstool may be plain or fancy, painted or stained to suit individual tastes and needs. The material used could be ¾-in. fir plywood or any of the other more expensive woods.

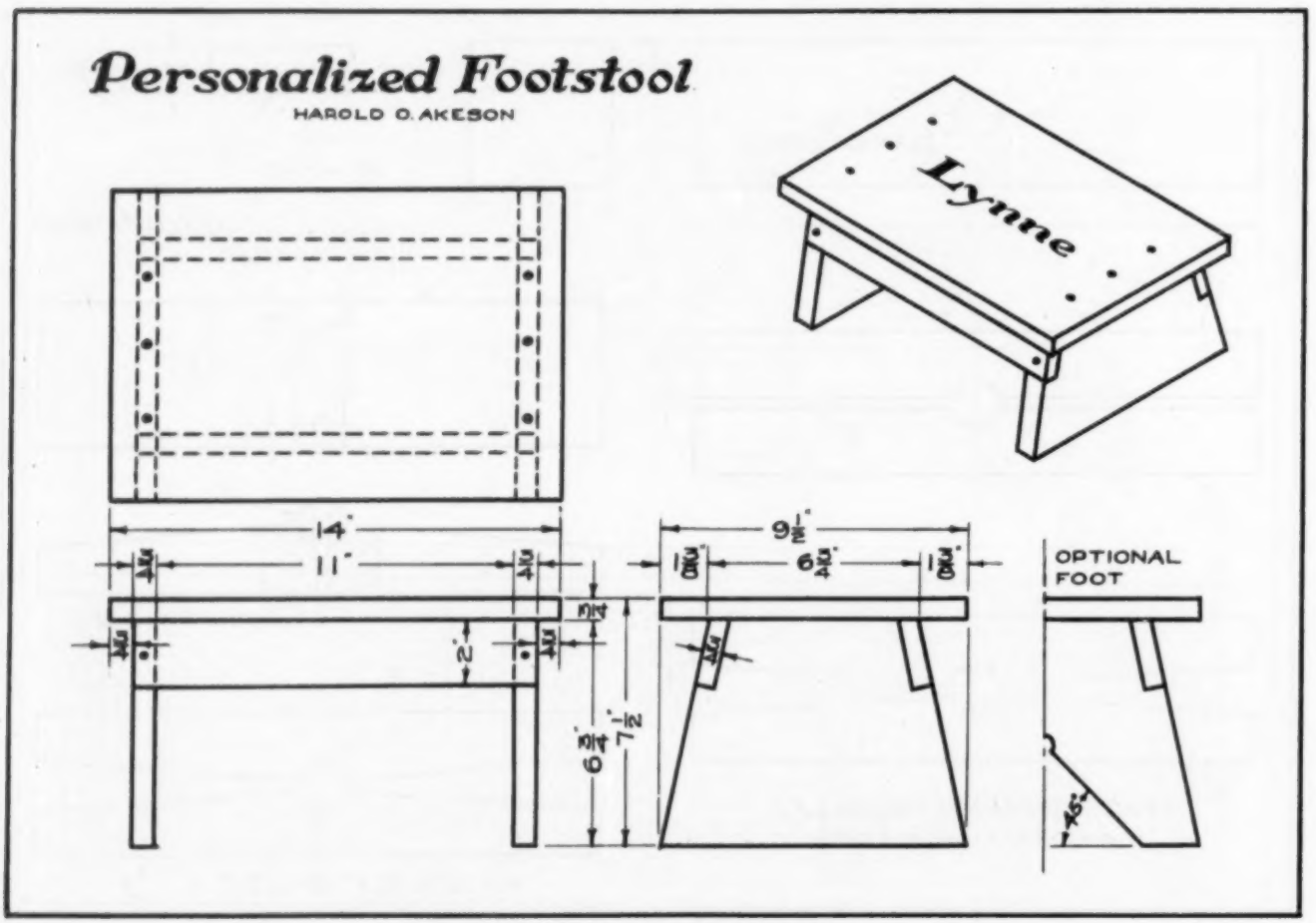
Lynne using her footstool

Lay out and cut the top, the two side pieces, and the two braces according to dimensions on the drawing. The grain of the wood for the sides should run vertically, because pieces with the grain horizontally would be likely to break under pressure. The two braces are either housed or fitted between the feet of the stool. If they are to be fitted between the feet, it will make a difference in the length of these pieces, as they will be 1½ in. shorter. This is the easiest method and wisest choice for the beginner. The screws, for holding the braces, will have to be changed if they are fitted between the feet, from the front and back to the ends of the stool.

Locate and drill holes for No. 10 by 1½-in. r.h.b. wood screws.

All the parts are to be thoroughly sanded before assembling. When assembled, the stool is ready for painting or staining, depending on the student's choice of finish to fit home needs.

The name is the last thing to be stenciled, or lettered, on the stool top. The art depart-



Personalized footstool by Harold O. Akeson

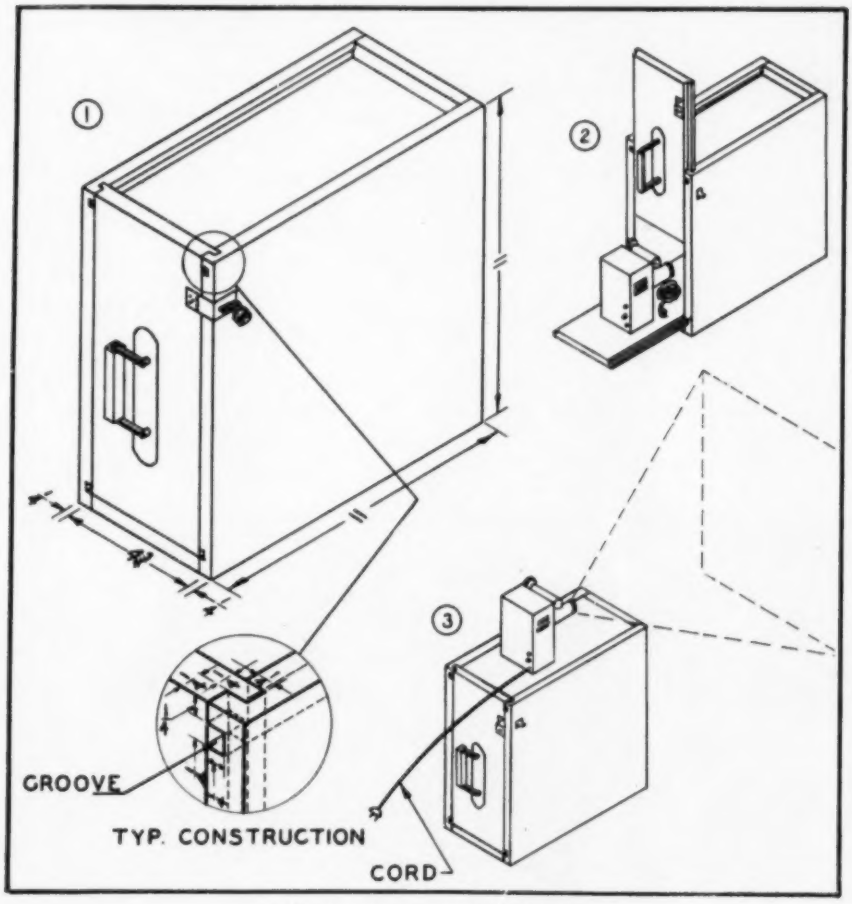
ment of the school usually has several students who are skilled in lettering and would be helpful in the selection of the style and application of the name.

PROJECTOR CASE

H. W. BOETTCHER
Head of Shop Department
Senior High School
San Bernardino, Calif.

A projector case is very useful where a projector is transported from one room or department to another. The projector is fastened by screws on a board at the bottom of the case, so that it will not be broken easily when the case is moved. This board is designed with tongues that fit in grooves at the top of the case; and when the cover is put into place, the projector is securely kept in place.

The typical construction detail should suffice for necessary information to build this case. Sizes are unimportant, only that it is necessary to make the box large enough for the type of projector to be housed. This case has been in use and found to be very practical. Isometric No. 1 shows the projector in the case locked up. Isometric No. 2 illustrates the removal of the cover and removing the projector from the box. Isometric No. 3 shows the projector in place to show slides.



Details of the projector case

A MEAT TENDERIZER

IRA H. JOHNSON
State Teachers College
Mankato, Minn.

The meat tenderizer, shown in Figure 1, is a metalworking project designed to meet the needs of many industrial-arts instructors. The materials required for making it are inexpensive, and its construction involves many processes and includes a wealth of related industrial material.

The first operation is the construction of a wood foundry pattern. A piece of mahogany, pine, or any other close-grained wood may be used. Figures 2 and 3 give constructional details.

First cut the pyramids on the pattern ends using a shop constructed jig and the circular

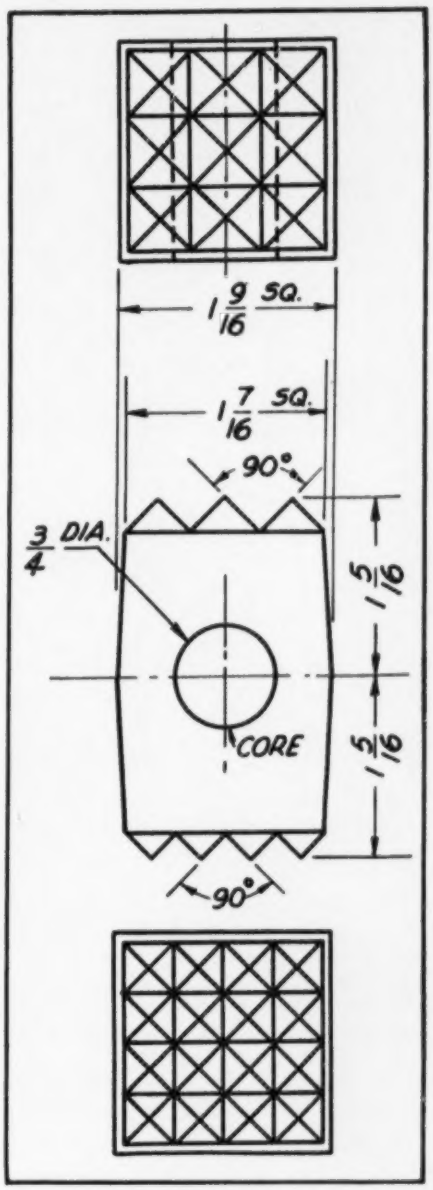
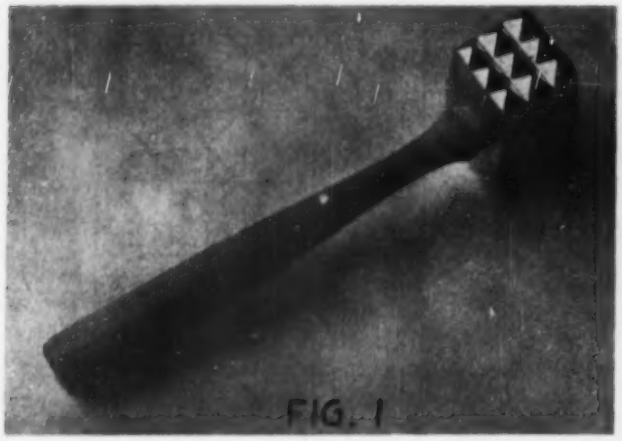


Fig. 2. Details of the meat tenderizer head

saw, as shown in Figure 3. Next bore the ¾-in. hole and cut through its center with the band saw. The half holes are then sanded deeper to make up for the material lost by the saw kerf. The draft or taper necessary to permit satisfactory removal of the pattern parts is then put on the pieces by means of a sanding disk with the table set at the required angle. Two pieces of mahogany ½ by 1 by 4 in. are glued together with a piece of wrapping paper in the joint. After turning the piece to ¾-in. diameter it is cut to a length of 3 in., and then split at the paper joint, after which each half is fastened into its respective place in the other pattern halves. The future positioning of these two



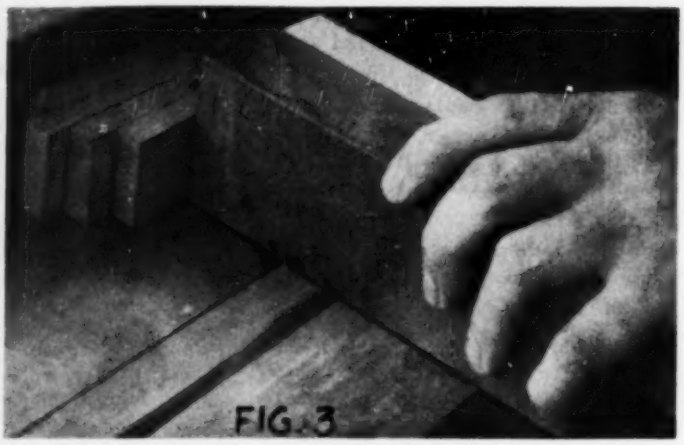


Fig. 1. Finished meat tenderizer with the turned and fitted wood handle. Fig. 3. Cutting the "points" on the meat tenderizer pattern. Note how equal thickness strips of wood are used as a jig for spacing

pattern parts is then assured by providing two ⅛-in. metal dowels in one piece and ⅛-in. mating holes in the other piece. The entire pattern is finished with several coats of shellac. See Figure 4.

A core box is constructed by gluing two pieces of pine ¾ by 2½ by 3 in. together with wrapping paper in the joint. A ¾ in. hole is bored all the way through with its center on the parting line. The piece is split and the future positioning of the two parts assured by the use of two ⅜-in. dowels and mating holes. Finish with several coats of shellac. See Figure 5.

The core is fabricated from specially treated molding sand. Mix the core sand thoroughly and in small quantities as it *spoils* if kept very long.* (The ingredients and proportions of a satisfactory mixture are given at the bottom of the page.) Dust the inside of the core box with parting compound and clamp the two parts securely together. Pack core sand into the cavity, remove the clamp, stand the core box on end, and tap gently. Remove

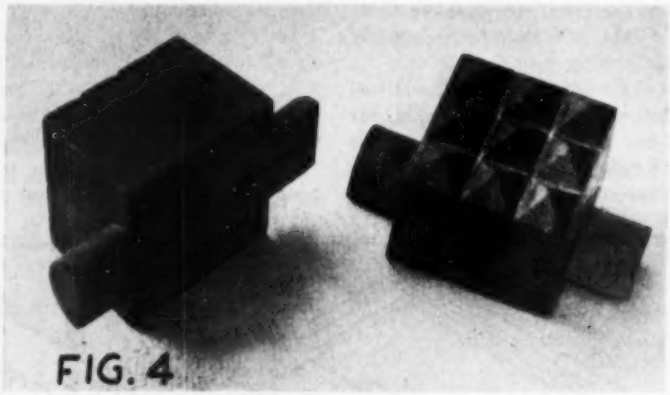


Fig. 4. Wood two-part pattern for the meat tenderizer

the core box, place the *green* core in an oven, and bake at approximately 400 degrees Fahrenheit for four hours.

For making the mold, place the half of the pattern that is without dowels on the molding board, surround it with the drag part of the flask, dust with parting compound, riddle sufficient molding sand to cover the pattern, and ram the rest full of molding sand. Turn the filled drag over, add the other half of the pattern and the cope part of the flask, dust the entire sand and pattern surfaces with parting compound, riddle sufficient molding sand to cover the pattern, and ram the rest full of molding sand. Separate the cope and the drag, moisten the area around the pattern, and carefully remove the two pattern parts. Cut a gate in both the cope and drag (must match and lead to a side that is not cored) leading to a sprue that should

*The following ingredients in the proportions indicated will provide a satisfactory core sand: white sand — 280 pounds, core oil — 2¼ quarts, Mogol binder — 2 pounds, and kerosene — 1 pint.

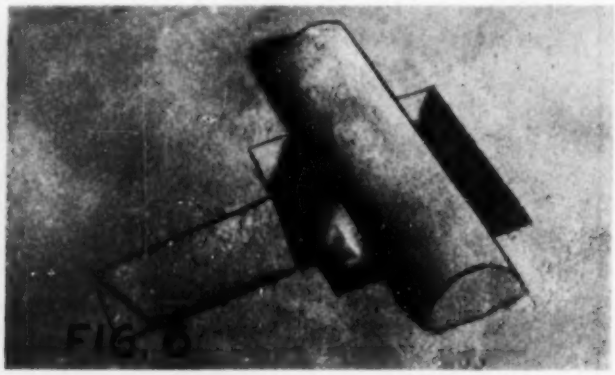


Fig. 5. Core box and baked core for the meat tenderizer head. Fig. 6. Drag part of sand mold for the meat tenderizer head, with the sand core in place and the drag of the gate cut

be cut in the cope. By making both of these cuts sufficiently large there is no need for a riser. Place the baked core in place, Figure 6, and replace the cope on the drag. Heat a sufficient quantity of aluminum and pour. After cooling, separate the cope and the drag, remove and discard the core, cut off the sprue, and file the area where it was attached to the casting to the desired shape.

Turn a wooden handle and fit it to the aluminum tenderizer. The finished and useful project may be taken home and the student has also experienced a correct method of fitting a handle.

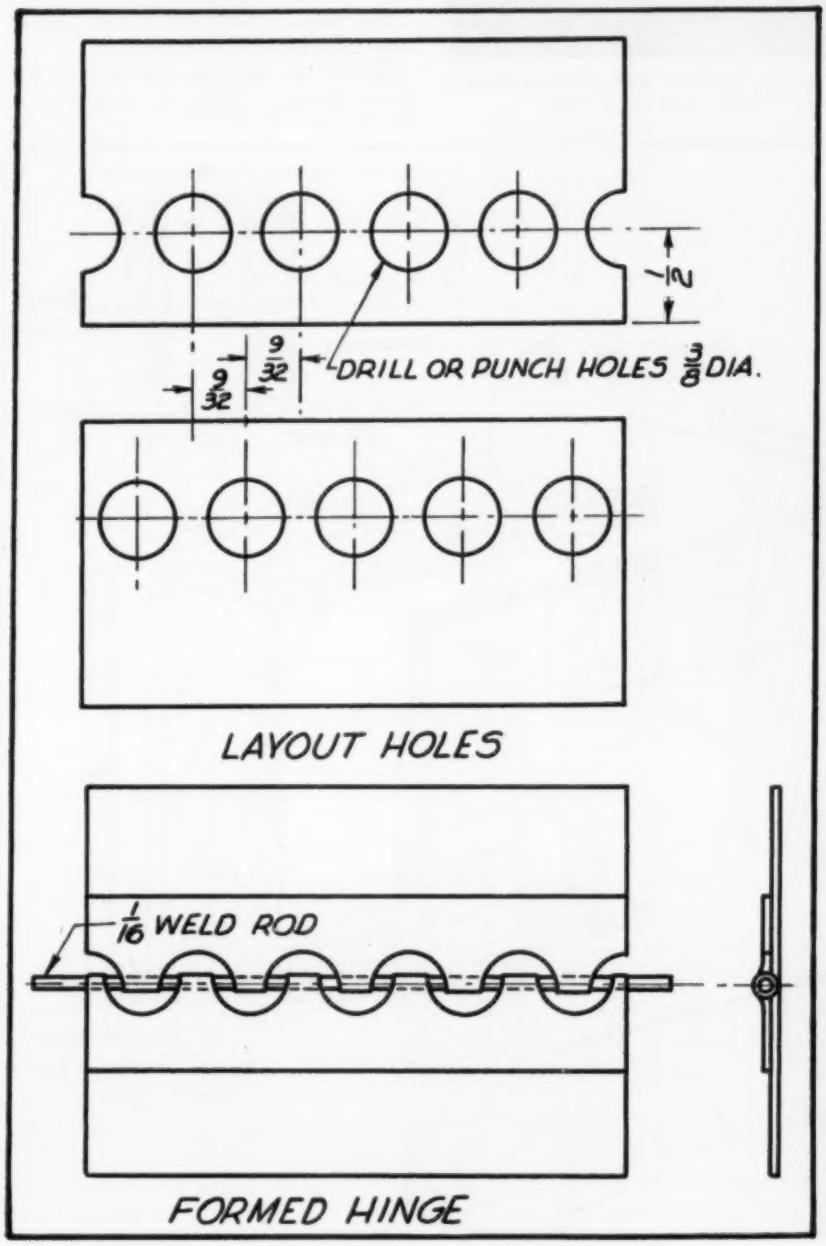
SIMPLIFIED HINGE

CARL CUMMINS
High School
San Diego, Calif.

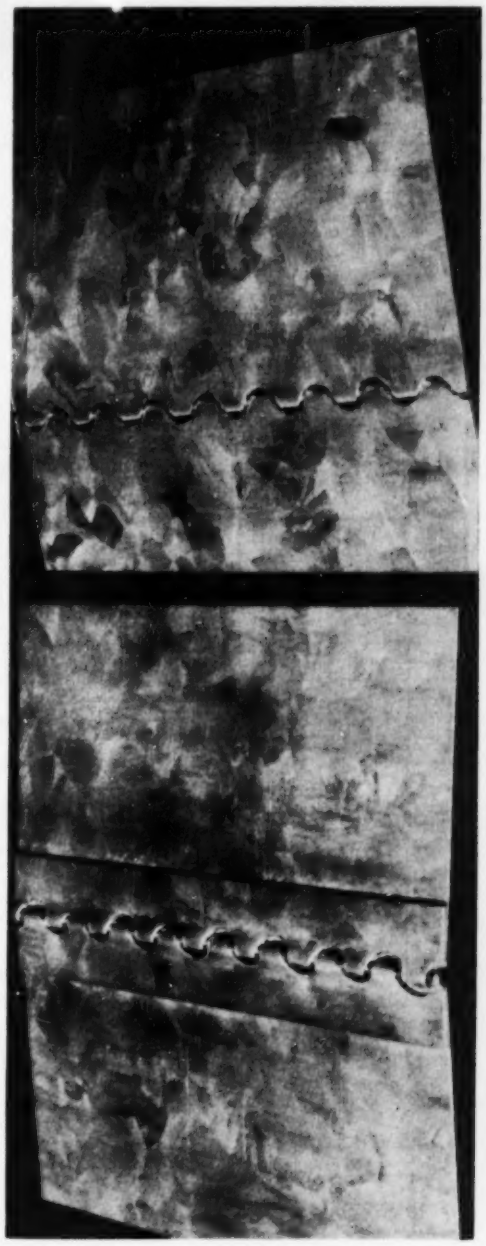
Many general metalworking instructors will agree that the construction of a sheet-metal hinge often presents an obstacle to students which is difficult to hurdle. In fact, the whole "professional touch" to a project can sometimes be decided by the appearance and function of a smooth operating hinge.

When using 20-gauge material or lighter it is quite simple to first lay off a ½-in. setback line along each edge of the two pieces to be hinged. Then, centerpunch at 9/16-in. intervals along each line, as shown in the sketch, and drill or punch ⅜-in. holes. This makes it possible to dovetail the two pieces together after a 180-deg. bend has been made in the bar folder. The center lines of the holes will then be 9/32 in. apart.

Obviously the holes may be made larger depending upon the use to which the hinge is to be put. However, it has been found that for a job of tool box size the ⅜-in. holes are quite adequate. Also, the hinge may be made



Details of the simplified hinge



Simplified hinge

as a continuous, piano-type, or merely formed in short sections.

The finished hinge results in a smooth, uniform, and professional job, and any student from the beginner to the advanced can be expected to achieve complete success.

SHADOW BOX

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Cadet Teacher
and
HERBERT ANDERSON
Assistant Professor of Woodworking
The Stout Institute
Menomonie, Wis.

It is not always easy to find a project suitable for ninth- and tenth-grade progress levels that will serve both as a core project and as a project that can be made on an industrial production-line plan.

Fig. 2. Shadow box with natural finish and white filler

Inasmuch as all students are required to participate in all phases of the production of the shadow box, basic woodworking operations are easily taught through this project. Furthermore, the shadow box makes an ideal gift, a desirable quality for developing incentive in a class.

The project described herein lends itself to quantity production, wherein all students first co-operatively plan the shadow box in its entirety. Students may then repeat a single operation many times and then join in final assembly or may produce a complete shadow box from beginning to end.

Most shops are equipped with the necessary tools and equipment to do this job.

Students may apply any type of finish they desire; however, finishing the shadow box to

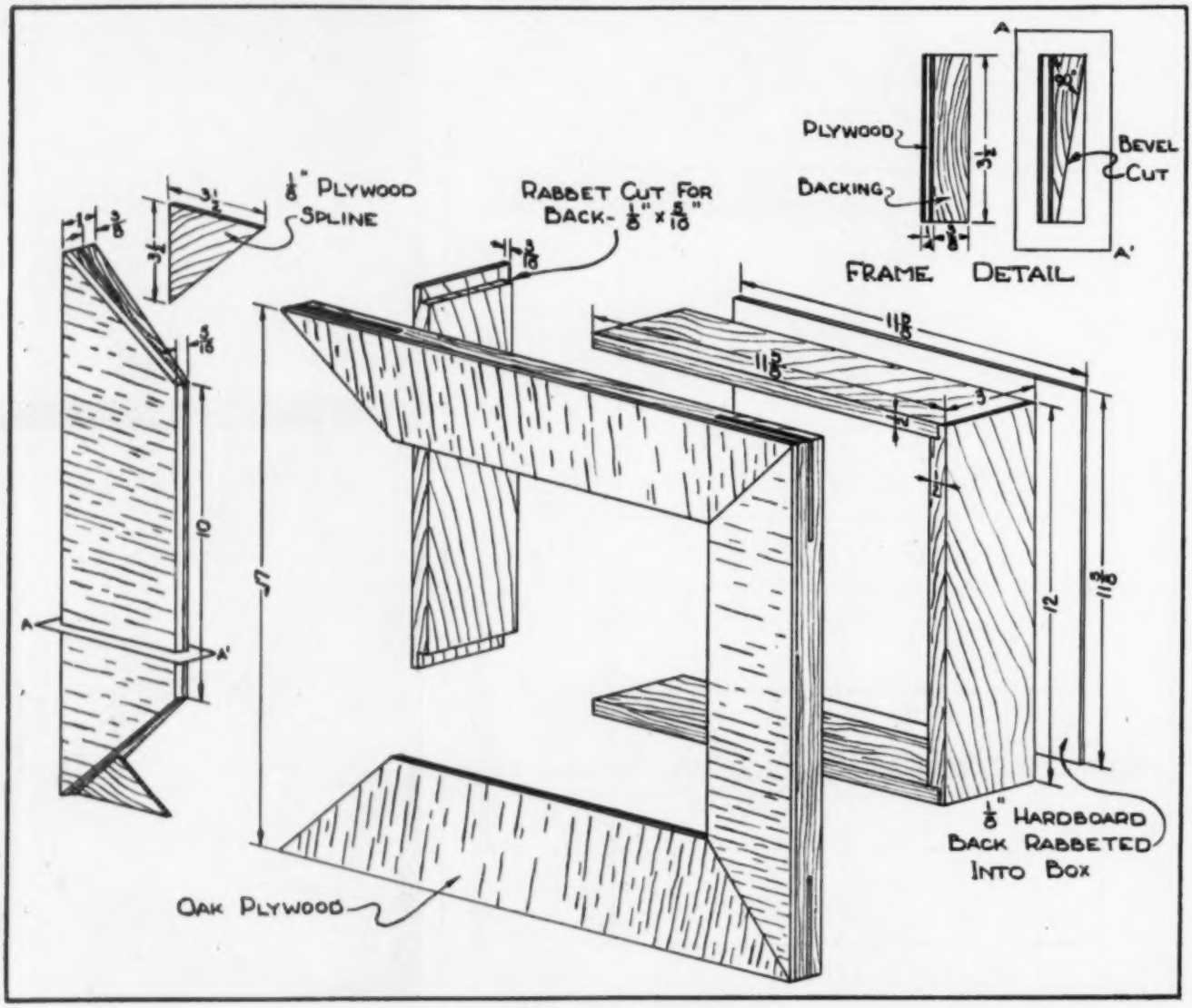

Fig. 1. Details of shadow box

blend with the furnishings in the home provides design problems to be solved.

Given below is a list of materials needed. Figure 1 is a working drawing of the shadow box. Figure 2 is a photograph of the completed box to which a natural finish with white filler has been applied.

List of materials:

4 pcs. ¾ x 3¾ in. x 18 in. basswood
4 pcs. ¼ x 3⅜ in. x 18 in. oak plywood
1 sq. ft. of hardboard
4 table top fasteners
4 ½-in. No. 4, r.h., blued, screws
Glue
Brads

In making the shadow box, it was found that the following procedures were satisfactory.

Frame

1. Rip basswood backing and oak plywood to rough widths.
2. Crosscut backing and oak plywood to rough lengths.
3. Rough joint face and edge of backing strips.
4. Joint better edge of oak plywood.
5. Glue oak plywood to basswood backing strips.
6. Rip to $\frac{1}{16}$-in. finished size.
7. Resaw bevel.

CAUTION: Keep stock tight against fence.

8. Joint bevel.

NOTE: Back side and edge make a 90-degree angle.

9. Joint outer edge at right angle to bevel.
10. Miter to length.
11. Cut for spline.

NOTE: Use a jig.

12. Glue and assemble frame.
13. Smooth frame.
14. Finish frame.

Box

1. Rough rip side and ends.
2. Crosscut to rough length.
3. Joint better side.
4. Joint better edge.
5. Surface back side.
6. Rip to $\frac{1}{16}$-in. finished size.
7. Joint to finished size.
8. Crosscut better end.
9. Cut to length.
10. Saw end rabbet.
11. Joint edge rabbet.
12. Smooth inside surfaces.
13. Assemble box.

NOTE: Nail and glue joints.

14. Make saw kerf for table top fasteners.
15. Final assembly of box and frame.
16. Cut hardboard back and fit.
17. Nail hardboard back.
18. Apply finish desired.

THE STUDENT PLAN SHEET

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Ball State Teachers College
Muncie, Ind.

Student Planning in Industrial Arts

In the beginning, industrial arts did not stress the objective of student problem solving. As set up in the early manual training classes, the course was more or less a series of predetermined exercises that each student had to undertake. As he finished one exercise he was given one which was graded as more difficult. Thus, the attention of the course and the teacher was directed toward the developing of manual dexterity with little or no thought given to developing the student's powers of initiative and the ability to think through a job. As the manual-arts program expanded, more thought was given to allowing the student to do some thinking for himself.

By 1900 the evolving philosophy of education began to affect manual training. More emphasis was being placed on the educational end instead of on the project alone. Drawing was used more and more as a means of developing student thinking habits. Manual arts was considered as an excellent place for presenting problem-solving situations similar to everyday life situations. The project method concerned with (1) having a purpose

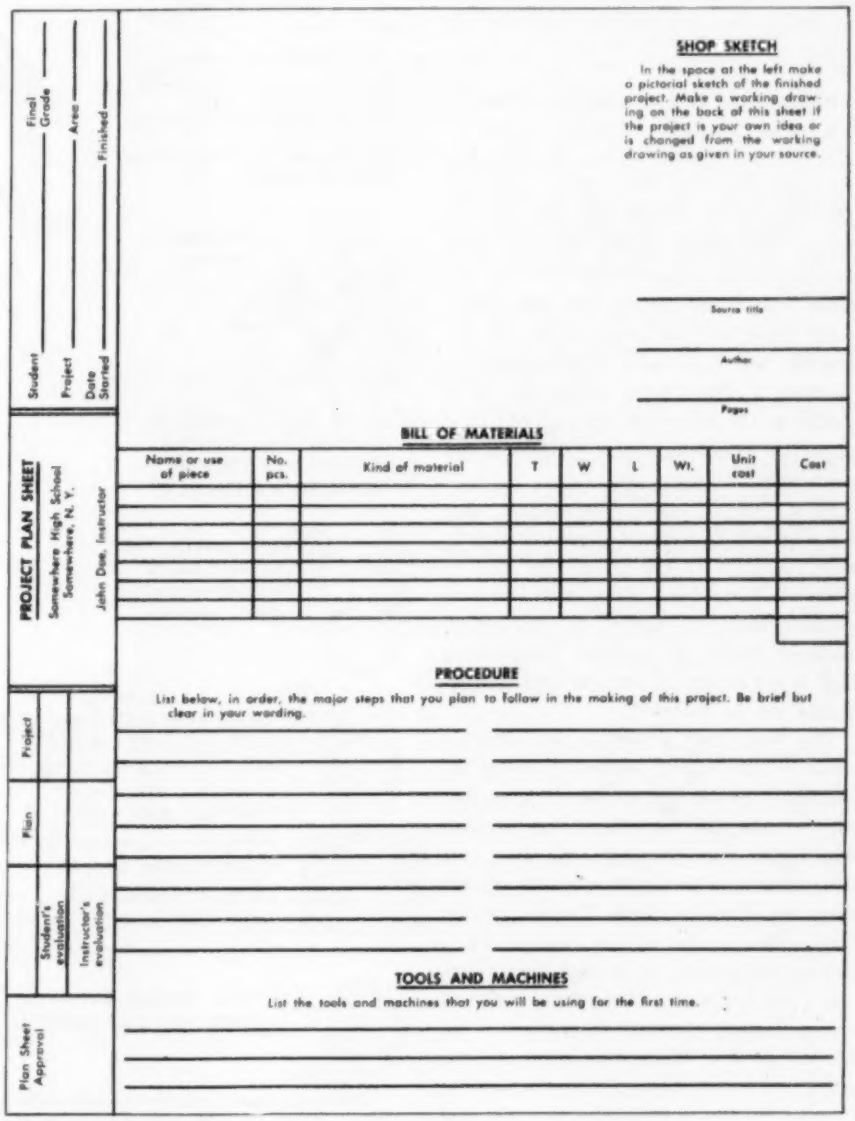

Student
Project
Date Started
Finished
Area
Final Grade
PROJECT PLAN SHEET
Somewhere High School
Somewhere, N. Y.
John Doe, Instructor
SHOP SKETCH
In the space at the left make a pictorial sketch of the finished project. Make a working drawing on the back of this sheet if the project is your own idea or is changed from the working drawing as given in your source.
Source title
Author
Pages
BILL OF MATERIALS
Name or use of piece
No. pcs.
Kind of material
T
W
L
Wt.
Unit cost
Cost
PROCEDURE
List below, in order, the major steps that you plan to follow in the making of this project. Be brief but clear in your wording.
Project
Plan
Student's evaluation
Instructor's evaluation
Plan Sheet Approval
TOOLS AND MACHINES
List the tools and machines that you will be using for the first time.

Fig. 1. The student plan sheet by Willard A. Allen

or seeing a need, (2) making a plan to fill this need, (3) executing the plan or doing the job, and (4) making an evaluation of the results, came into being during this period.

Industrial-arts objectives now include a definite reference to the developing of student thinking and problem-solving ability. It might be considered as one of the most important aims when one realizes that the continuation of the way of life that we now live in depends upon the freedom and individual thinking of each person. The success of democracy depends upon the ability of each individual to be able to reason out and make his own decisions. The importance of giving the student an opportunity to think out and plan his work is great. The values of including this activity in the industrial-arts program are many.

Preparation of a Student Plan Sheet

It is recommended that the instructor observe the following points in preparing the plan sheet form to be used. The plan sheet should be simple and informal in nature. The student should not feel, after glancing at the sheet, that it is a complicated form to fill out. At the same time, if the sheet is of a simple form, the instructor will have very little trouble in checking it. Plan sheets should not be a burden to the instructor, they should be a means of broadening and increasing the effectiveness of his course.

Plain, simple, easily understood language should be used. It should be clearly understandable to the group that will be using the plan sheet. Along with this, the printing must be legible. All extraneous material should be omitted. Information that is not a part of the planning process should not be included.

The form itself should be neat and attractive. The layout should be carefully considered in the light of the students that will be using the plan sheet. Any form of duplication can be used with good results. The type used will probably depend upon the school facilities. Printing of the form either in the school shop or by a commercial printer is the best but it does not allow for minor changes as easily as the duplication methods. Regardless of the method used in duplicating the form, the paper stock must be of a good grade as it must be able to withstand repeated erasures and rough handling.

A frequency study of the items found on twenty different plan sheets in use revealed 26 different features not including name of school, student's name, and instructor's name. These are as follows in order of most used to least used.

1. Name of the project
2. Bill of materials
3. Steps or procedure of building
4. Date started
5. Teacher's evaluation
6. Date finished
7. Pictorial sketch of project
8. Teacher's approval of the whole
9. Total time for building
10. List of tools and equipment
11. Source of project or reference
12. Unit or area of work
13. Working drawing of project
14. Teacher's approval of the parts
15. Related information
16. Student's evaluation
17. Changes in the plan
18. Reason for choosing project

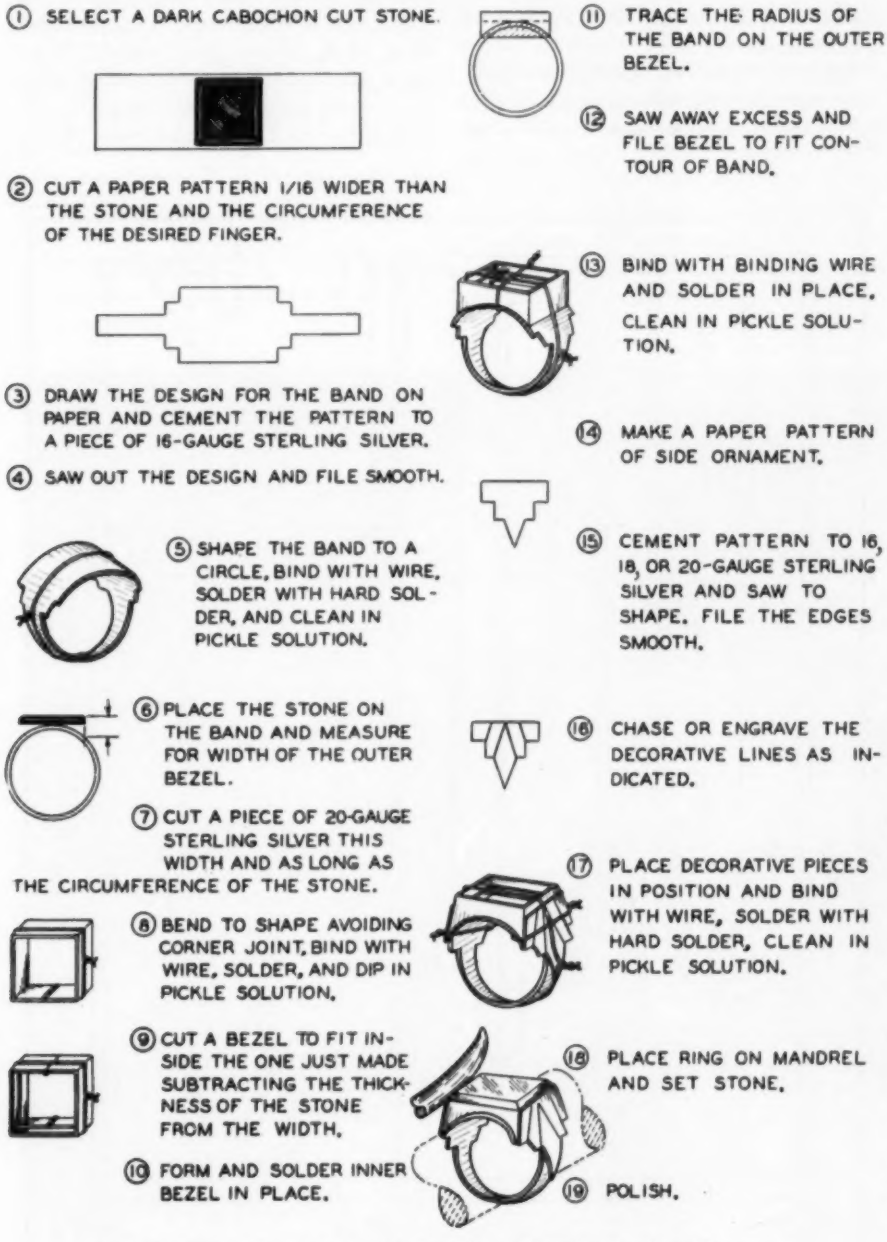
(1) CUT BAND OF 18-GAUGE STERLING SILVER 3/16 WIDE & CIRCUMFERENCE OF FINGER.
(2) CUT OR SAW SLITS IN BAND.
(3) ANNEAL METAL AND SPREAD ENDS SLIGHTLY.
HARDWOOD BLOCK
(4) SHAPE TO FIT FINGER BY PLACING RING MANDREL OVER BAND AND STRIKING MANDREL WITH A MALLET.
(5) BEND OUTER TABS PERPENDICULAR TO TOP OF RING AS INDICATED BY USING PLIERS.
(6) PLACE A PIECE OF 20-GAUGE ANNEALED COPPER OVER THE STEEL BLOCK AND TAP MALE DIE WITH HAMMER UNTIL SHEET FITS THE DEPRESSED AREA. WHEN OPERATION IS SUCCESSFUL REPEAT USING 20-GAUGE STERLING SILVER.
(7) TRIM TO EDGE WITH TIN SNIPS AND FILE SMOOTH.
(8) PLACE SILVER ON PIECE OF ABRASIVE CLOTH AND SAND FLAT.
(9) CUT BAND OF BEADS TO FIT CIRCUMFERENCE OF SILVER.
SOLDER WITH SILVER SOLDER.
(10) CUT DISK SAME DIAMETER AS OUTSIDE CIRCUMFERENCE OF BAND OF BEADS.
(11) BIND HALF SPHERE, BEADS, AND PLATE TOGETHER AND SOLDER.
(12) FIT BAND TO SETTING, BIND WITH WIRE, AND SOLDER.

Project sheet — Lady's ring submitted by Clifford L. Yard and Henry J. Kauffman, industrial-arts department, State Teachers College, Millersville, Pa.

19. Date when material was paid for
20. List of new terms
21. Instructor's remarks
22. Hardware list
23. List of safety precautions
24. Foreman's mark
25. Test on fundamentals
26. Specifications or description

In general, the plan sheet should be of one page construction if all the material necessary can be included. The plan sheet style in this article is made up with this in mind. The feature of placing the title strip on the left edge for filing and convenient reference made it possible to have more room for including the planning features as listed above. A copy of a plan sheet style is shown in Figure 1. Revisions could be used to adapt this style to various teaching situations.

The effective use of the student plan sheet depends upon the methods used by the instructor in promoting its use. The instructor is primarily responsible for the success in this venture. He must initiate student planning by showing its need and follow-up by constantly helping but not actually solving the individual problems. The instructors part in student planning and the use of student plan sheet is very important.


① SELECT A DARK CABOCHON CUT STONE.
② CUT A PAPER PATTERN 1/16 WIDER THAN THE STONE AND THE CIRCUMFERENCE OF THE DESIRED FINGER.
③ DRAW THE DESIGN FOR THE BAND ON PAPER AND CEMENT THE PATTERN TO A PIECE OF 16-GAUGE STERLING SILVER.
④ SAW OUT THE DESIGN AND FILE SMOOTH.
⑤ SHAPE THE BAND TO A CIRCLE, BIND WITH WIRE, SOLDER WITH HARD SOLDER, AND CLEAN IN PICKLE SOLUTION.
⑥ PLACE THE STONE ON THE BAND AND MEASURE FOR WIDTH OF THE OUTER BEZEL.
⑦ CUT A PIECE OF 20-GAUGE STERLING SILVER THIS WIDTH AND AS LONG AS THE CIRCUMFERENCE OF THE STONE.
⑧ BEND TO SHAPE AVOIDING CORNER JOINT, BIND WITH WIRE, SOLDER, AND DIP IN PICKLE SOLUTION.
⑨ CUT A BEZEL TO FIT INSIDE THE ONE JUST MADE SUBTRACTING THE THICKNESS OF THE STONE FROM THE WIDTH.
⑩ FORM AND SOLDER INNER BEZEL IN PLACE.
⑪ TRACE THE RADIUS OF THE BAND ON THE OUTER BEZEL.
⑫ SAW AWAY EXCESS AND FILE BEZEL TO FIT CONTOUR OF BAND.
⑬ BIND WITH BINDING WIRE AND SOLDER IN PLACE. CLEAN IN PICKLE SOLUTION.
⑭ MAKE A PAPER PATTERN OF SIDE ORNAMENT.
⑮ CEMENT PATTERN TO 16, 18, OR 20-GAUGE STERLING SILVER AND SAW TO SHAPE. FILE THE EDGES SMOOTH.
⑯ CHASE OR ENGRAVE THE DECORATIVE LINES AS INDICATED.
⑰ PLACE DECORATIVE PIECES IN POSITION AND BIND WITH WIRE, SOLDER WITH HARD SOLDER, CLEAN IN PICKLE SOLUTION.
⑱ PLACE RING ON MANDREL AND SET STONE.
⑲ POLISH.

Project sheet – Man's ring submitted by Clifford L. Yard and Henry J. Kauffman, industrial-arts department, State Teachers College, Millersville, Pa.

A SHOP FILING SYSTEM

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Industrial-Arts Instructor
Pierrepont Junior High School
Rutherford, N. J.

Everyone in shopwork has, no doubt, experienced the following: "Mr. Swenson, where is a plan for an end table?" "Mr. Swenson, have you any designs for wall shelves?" "Where can I find a different type plastic project?" etc.

It was with the idea of helping boys to answer their own questions, that I launched into the gigantic task of setting up a shop filing system that would:

1. Be simple enough for boys to understand.
2. Be easy to use and easy to refile.
3. Cover as wide a group of subjects as possible, and
4. Provide for future additions, expansion, and changes.

A great many items were clipped from craftwork and professional magazines. These were filed in regular folders under appropriate headings. Project plans of jobs that were within the ability of junior high students were mounted on 9 by 12-in. sheets of 200 pound oak tag. This has been found to be the most substantial mounting when used over and over again in the shop.

The first breakdown into three classes of materials was then made: (1) Projects — mounted, (2) Shop information — mounted (teaching aids and visual aids), (3) General Information — unmounted in folders.

The next move was to break down the pile of mounted projects into the following separations: woodwork, art metal, sheet metal, wrought iron, electrical, cement work (including cement projects), plastics, leathercraft, foundry, wood turning, wood carving, electroplating, basketry, Indian lore, designs and silhouettes (anything that was purely a design motif that

could be used with any type material), and shop information. Additional classifications could be set up to meet local differences in curricular offerings and shop equipment.

Woodwork, red; art metal, blue; sheet metal, green; wrought iron, orange; electrical, purple; cement work, brown; plastics, yellow; designs and silhouettes, olive green and purple; leathercraft, black; foundry, pink; wood turning, red and light green; wood carving, red; electroplating, luggage tan; basketry, violet; Indian lore, lettuce green; shop information, light blue.

The woodworking section contained the largest group of cards. These were arranged under the following subheadings:

Birdhouses and feeders W–1; book ends W–2; book cabinets W–3; camp equipment W–4; children's furniture W–5; desk sets W–6; foot stools W–7; games W–8; garden articles W–9; kitchen articles W–10; lamps W–11; novelties W–12; picture frames W–13; plant stands W–14; Red Cross articles W–15; serving trays W–16; tie racks W–17; toys W–18; wall shelves W–19; door stops W–20; desks W–21; cabinets W–22; tables W–23; magazine racks W–24; sporting equipment W–25; tissue dispensers W–26; shop equipment W–27; odd furniture W–28; model boats W–29; model railroad equipment W–30; model airplanes W–31.

All the other woodworking projects were assigned to the "Novelties" W–12 section until such time as there were enough of any type of project to make a separate classification. This section is handled differently than the others, for again it grew in size until a plan had to be devised to facilitate finding which project card was wanted and when it was wanted. This was solved by numbering each card consecutively as per the following example:

For each of these cards 3 by 5-in. file cards were typed under various headings, so that they could be cross-indexed. On these cards a brief description of the project was placed, and in the upper right hand corner, the number designation of the project card. If a boy is looking for, let us say, a window cornice, he can look in the 3 by 5-in. file for that title, in the section on woodworking projects and make a list of the card numbers he finds. Then by going to the woodwork projects mounted file in section W–12, he will find the design he is looking for.

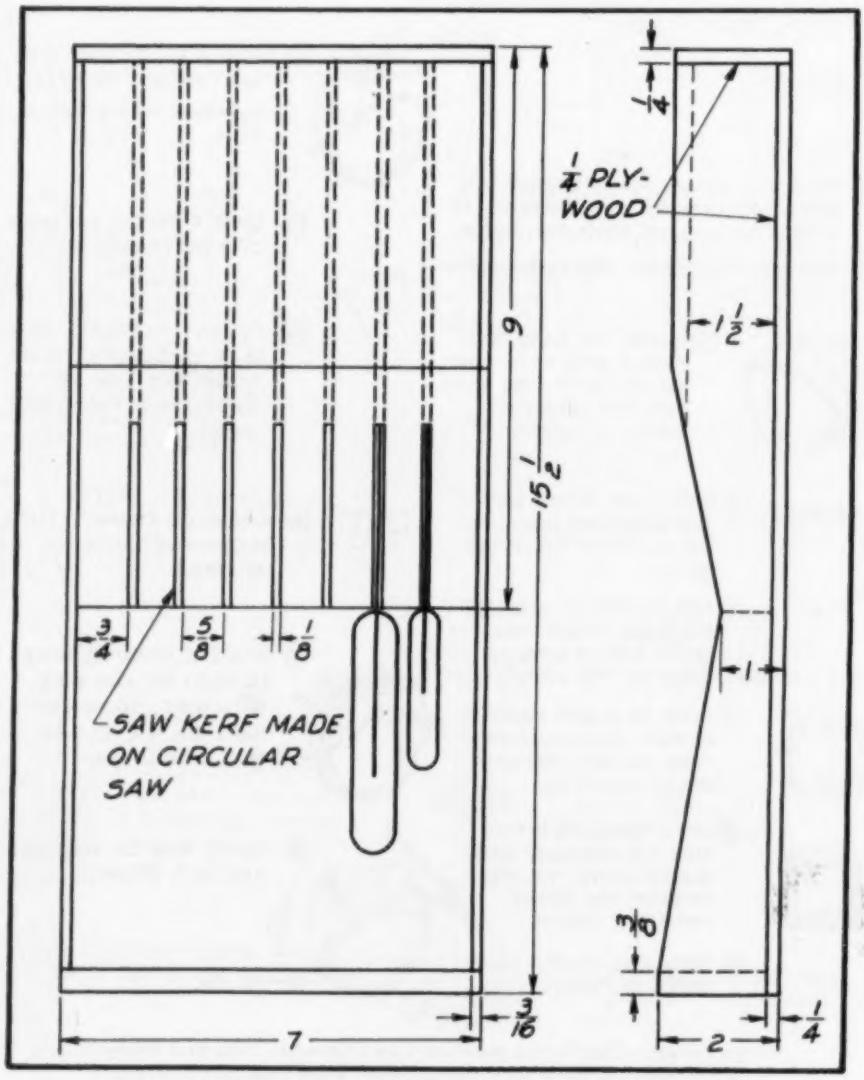
Under *art metal*, are filed projects in hammered copper, brass, or aluminum, using the processes of beating or raising; also jewelry designs. So far, we have the following headings: lamps AM–1; bowls AM–2; ash trays AM–3; trays AM–4; novelties AM–5;* book ends AM–6; flower and plant stands AM–7.

Under *sheet metal* are classified projects made of sheet tin, galvanized iron, black iron, or aluminum, usually of larger size. We have the following subjects designated as follows: dust pans SM–1; picture frames SM–2; kitchen articles SM–3; miscellaneous SM–4.

Under *wrought iron*, are filed any projects made from the various shapes of mild steel such as: magazine racks WI–1; smoking stands WI–2; fireplace sets WI–3; lamps WI–4; candlesticks WI–5; brackets and signs WI–6; flower stands WI–7; miscellaneous WI–8; tables WI–9; wall shelves WI–10.

In the *shop information file*, which is kept separately and mostly for the use of the instructor, there are all types of illustrative material that may be useful for instructional purposes. This material is classified under the following classifications: wood lathe SI–1; steel square SI–2; rulers and measurements SI–3; files and filing SI–4; planes SI–5; chisels SI–6; screw drivers SI–7; grinders and grinding SI–8; wood bits SI–9; cold chisels SI–10; drill press SI–11; circular saw SI–12;

*The novelties section is treated the same as the woodwork novelties.



Drawer knife rack by Louis Barocci, High School, Cudahy, Wis.

band saw SI–13; jointer SI–14; miniature power tools SI–15; knives SI–16; miscellaneous tools SI–17; quiz cards SI–18; art-metal processes SI–19; woodworking processes SI–20; soldering SI–21; home mechanics SI–22; wrought-iron processes SI–23; hand saws SI–24; hardware SI–25; hacksaws SI–26; metal finishing SI–27; safety SI–28; wrenches SI–29.

One problem that arose as the file grew, has to do with projects containing two or more materials, such as, wood and art metal, wood and plastic, plastic and art metal, wood and sheet metal, and the like. This was solved by marking the top of the card with both corresponding colors and filing it under the heading of the predominant material. In the 3 by 5 card file, cards are cross-indexed so that they appeared under each material and under as many titles as necessary.

This system has been in use for a number of years and has been found to work quite successfully.

CARPENTRY AND WOODWORKING TEACHING AIDS

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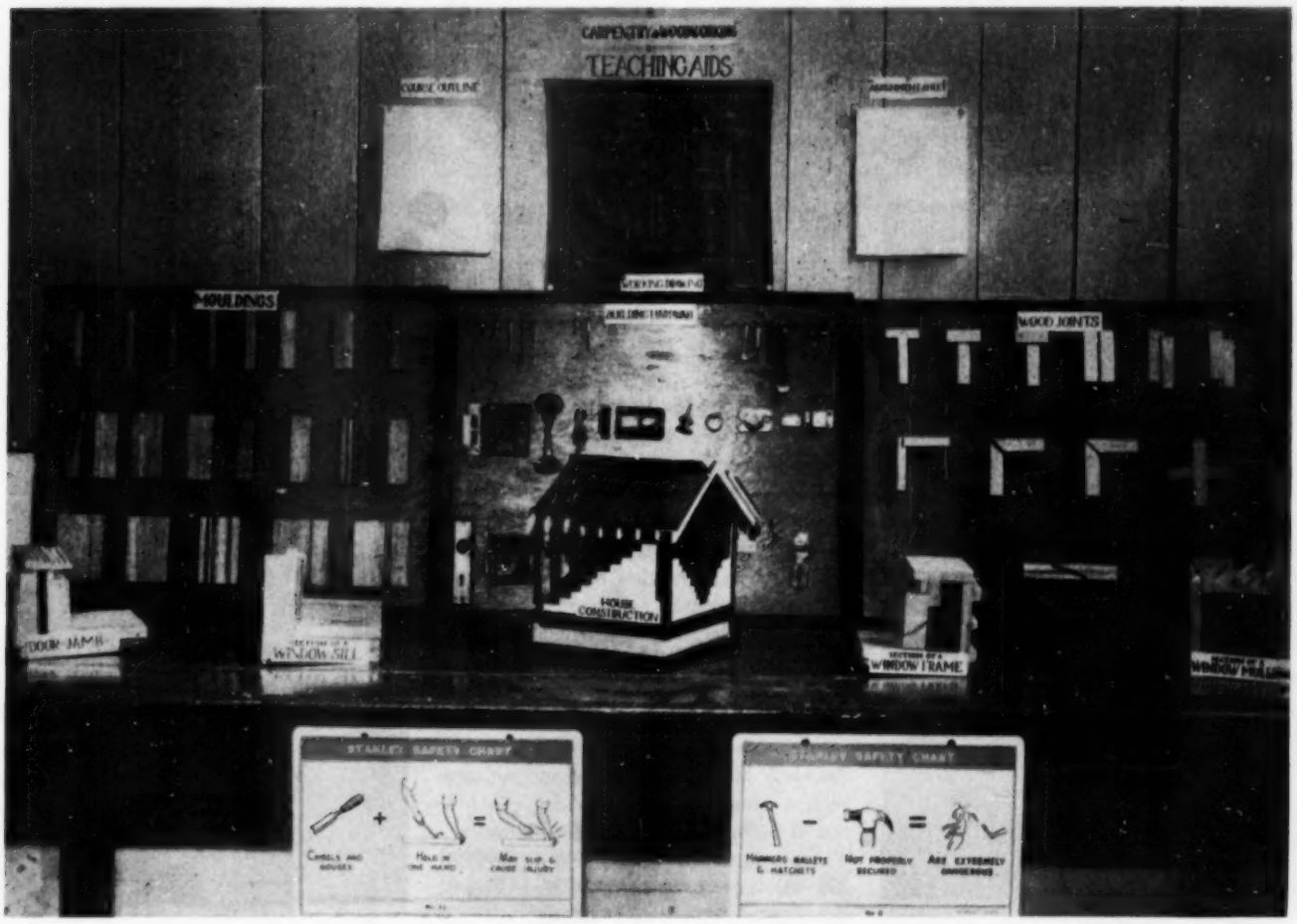
Pine Bluff, Ark.

It has been found that visual teaching aids are timesaving devices for both the teacher and the student. The aids might require some of the teacher's time to construct, but after they are constructed they tell a story in a much briefer time than he could do with words. Students like visual teaching aids because they are easily understood. The aids that are shown in this article are for classes in woodworking and carpentry.

A course outline is one of the first things a teacher should prepare, so that he and the students will know exactly what is to be taught and accomplished. The outline should state clearly the objectives and the content of the course in detail. Assignment sheets should accompany the outline, but the students should be given the assignment sheets periodically, so they will know what projects are required of them and when they are due.

Usually, in beginners' woodworking courses the teacher is concerned with the students becoming acquainted with the use of hand tools. Frequently students will be assigned projects that will have the various types of wood joints in their construction. By constructing these projects, students use all the common hand woodworking tools. A display board with all the common woodworking joints would clarify the teacher's explanation of how these joints look and how they are constructed. Often the teacher will let the students select the types of joints they desire to use in their projects from the joint display board.

An example of the desired type of working drawing for a project to be made of wood is always helpful for a teacher who requires his advanced students to make



Teaching aid for the carpentry and woodworking classes

drawings for all of their projects. It gives the students an idea of the type of drawing that is desired of them. Working drawings help the teacher and the students; that is, they help the students to understand the shapes, sizes, and construction of their projects thoroughly, and they permit the teacher to criticize them before any materials have been wasted.

Teaching students names of parts of a frame house is a difficult job for a carpentry teacher, if he does not have a cutaway section of a house to show the various parts and their relationship to other parts. A cutaway model of a frame house will solve this problem. From it the student can readily see the various parts of the house and their proper place in the structure.

Building hardware is an important item in a carpenter's work, but it is often overlooked by teachers. Panels with the different types of nails, screws, locks, etc., will assist the teacher greatly in teaching this subject. These panels will aid the students in learning the names and sizes of various types of hardware.

Millwork is fascinating for students who are interested in both cabinetmaking and carpentry work. Actual sizes of cross sections of various kinds of windows and doors are much easier to understand than detail drawings of these sections. A panel of the actual sizes and shapes of different kinds of moldings will aid in the teaching of moldings.

Safety is often a problem in our school shops, but many of the accidents could be eliminated if certain precautions are taken. Wall charts are very helpful if they are properly selected and well placed in the shop. Many manufacturers publish helpful safety charts and they can be secured easily.

Fig. 1. House built by students of Hobart High School, Hobart, Okla.

Fig. 2. Students working on the interior of the house

STUDENT BUILT HOUSES

R. C. KLEINER
Public Schools
Hobart, Okla.

High school students studying the building trades are seldom fortunate enough to enjoy the benefits of theory and practice in the inspiring and cohesive atmosphere of a single, unified project. Laying brick at one end of a school shop, building dormers at the other, and running molding at another place seldom gives students the inspiration that results from working on a large and unified structure.

A project large enough to give students such a compelling and attractive atmosphere while offering them an opportunity to learn as much as possible about their future vocation would be on a par with the ideal. How to inaugurate and continue such a program is a perplexing problem, but it contains a rewarding solution.

One solution to the problem of integrating the job of the school instructor — teaching — with the wishes of the students — obtaining a feeling of satisfaction, assurance, and pride in the work he is doing — is contained in the house-building programs for industrial-arts students that are in existence in various parts of the country.

House-building by students under the tutelage of school instructors, begun in

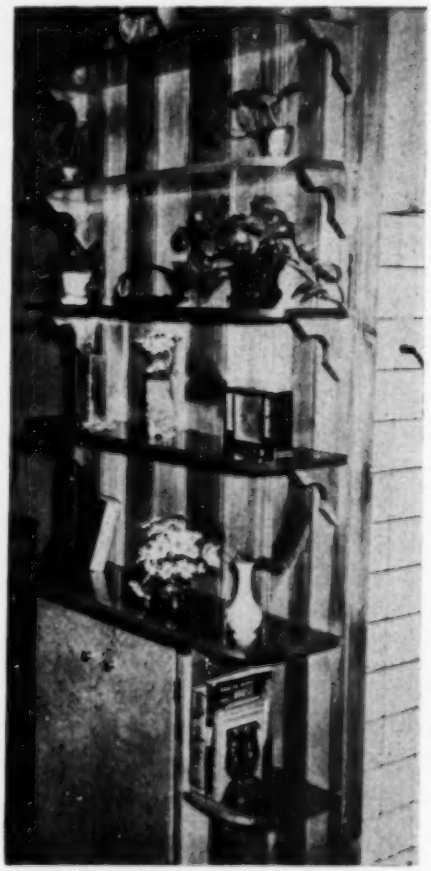


Fig. 3. Example of interior work done in the house

scattered parts of the country, has attracted enough attention and produced sufficient results to make it worthy of consideration by more and more shop instructors.

Granted that a project that launches high school students into the actual building of a house is an ambitious one, it is completely within the capabilities and facilities of almost all high school shops. Granted that the actual building of a house (which, as a reasonable requirement of such a project, must be salable) might appear to be beyond the abilities of students of high school age. The various programs presently in operation in various parts of the country, however, have completely dispelled that theory. Experience with such projects has shown that students are capable of building a salable house during the school year. And the sale of houses built has enabled school shops involved in such programs to purchase machinery that has made their shop second to none in the area, while the students obtain a knowledge of their trade that it would have been almost impossible to obtain in any other way.

The method of organizing and inaugurating such a program depends upon various factors: present shop equipment, money that might be obtained, time that can be allotted to the program, and acceptance by school officials.

A shop that has a representative amount of equipment can be considered to have a sufficient amount of tools and machinery to permit the instructor to consider a house-building project. Time, money, and acceptance are problems that would be different in different schools, but a little investigation would soon show the extent to which such a program might be carried.

One thing that should not be overlooked during the consideration of such a program is the aid that will be given by business concerns connected with the building trades. Lumberyards have been and continue to be willing to co-operate in promoting such programs. The most expensive item — lumber — involved in carrying a program of this sort to completion will frequently be advanced by lumberyards if they can be assured that the thoroughness of your planning will produce a salable house. Hardware stores and machinery supply houses would also be willing to advance material and supplies if they can be shown that the project would be successful. Their interest in promoting such a program is twofold: (1) backing of such a program is good public relations, and (2) they would be establishing a contact with students who stand a better than average chance of being future buyers.

Specialized work such as plumbing and wiring can be obtained on the same basis. Once the program has proved itself, there will be little difficulty in obtaining support for future projects. It is possible to obtain FHA aid once such projects have produced results in the form of one or two houses sold.

Planning is therefore the basis of getting the project started and carrying it through to a successful finish. Careful planning is required to show the school authorities that it is within the realm of the students' capabilities; careful planning is necessary to obtain the support of businesses that might aid in the financing of the program; careful planning is a must if you are to obtain the interest of students and to establish the program with an idea of continuing it.

Planning should include many things. It should include the type of house to be built: size, construction methods, and time the building of the house would require. Planning should include the location of the house: proximity to the school, how its location will affect the sale. It should also include the cost of the house and a definite knowledge of what you would require. Planning should also include a knowledge of the aid on which you can be reasonably assured: from whom you might expect aid, and how much. Preliminary inquiries will soon indicate what you might reasonably expect. Planning should also include a definite plan for selling the house.

Such a program, once it has been well planned and put into effect, will produce results that will permit the development of an excellent shop, train students in an almost incomparably thorough way, and give students a new sense of pride and interest in their trade.

Americans paid a cost of $3,400,000,000 for motor vehicle accidents in 1951. This includes property damages, insurance, medical expenses, and wage loss. — *The National Safety Council.*

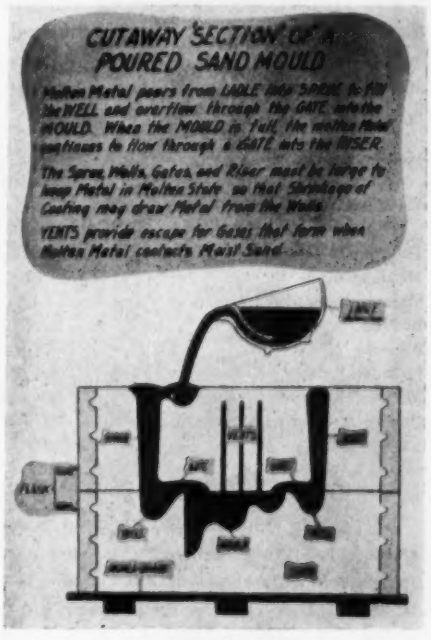
A GENERAL SHOP FOUNDRY

JULES BERTIN
Avonworth School Shop
Ben Avon
Pittsburgh, Pa.

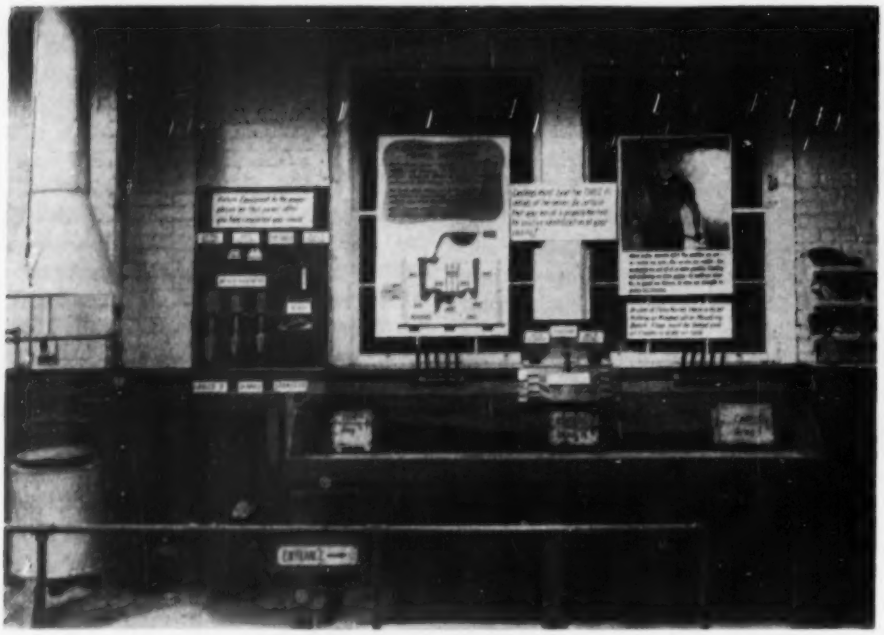
Instructors of industrial arts are, generally, able to justify the areas of activity included in their programs. Thus, it may be assumed that the areas of activity of any general shop program are selected for the purpose of fulfilling the established educational philosophy of the school. Inasmuch as public schools operate on limited budgets, costs are frequently a deciding factor in the selection of a new area to supplement the existing areas. Another factor that must be considered in selecting a new area of activity is the matter of available space; it is rare that a teacher will find space into which another area can be squeezed in an already crowded shop.

Therefore, the three basic considerations that must be weighed in considering a new general shop area are: (1) it must fulfill an educational need, (2) the costs must not be prohibitive, and (3) it must fit into available limited space. The general shop foundry meets all three requirements.

A foundry area affords ample opportunity for expanding activities of the woodworking area to include patternmaking as well as supplementing the activities of the



The sand mold



Arrangement of foundry area

metalworking area, or of being the core of a complete new metalworking area. A foundry can be set up and operated on a floor area of approximately eighty square feet to provide three work stations. At nominal cost, well within the budget of practically any school district, an amply equipped foundry can be set up that will meet the needs of a general shop.

The accompanying photograph, showing the foundry of the Avonworth Union School District shop, illustrates a foundry that can be duplicated for two hundred dollars. The breakdown of equipment costs of the Avonworth shop foundry, at current prices, is as follows.

Melting furnace (Bunsen burner type, without blower)	$135.00
Materials for molding bench (wood, metal-lined)	18.00
Materials for ten flasks (assorted sizes)	15.00
Molding sand	8.50
Slicks, spoons, and trowel	4.00
Bellows	2.50
Asbestos gloves	3.00
Foundry parting sand	2.00
Materials for bench rammers	2.00
One each, numbers 3 and 5, bottom pour ladles	10.00
	$200.00

The author's interest in the aluminum foundry has grown because this area has provided a wide range of associated educational activity. It should be noted that no foundry area can ever be justified if the activities are confined exclusively to the casting of projects whose molds are made from a few, random selected, commercial items. All too common is the practice of casting only book ends, Lincoln heads, and a very limited number of other items that consume much metal without giving pupils the opportunity for learning new processes, techniques, and experiences. The learning will be much too limited unless the project selection is extended beyond conventional, readily available items. The element of good design, combined with original creative ability or the ability to redesign or modify existing ideas, is a basic need in establishing an interesting and worth-while foundry operation in the general shop. The designing of interesting projects and the making of patterns to stimulate pupil interest in the initial stages of foundry operation will require considerable time and effort of the teacher. Following the kindling of pupil interest through the medium of teacher-made patterns and sample finished castings, the development of other projects can be furthered by both teacher and pupil efforts.

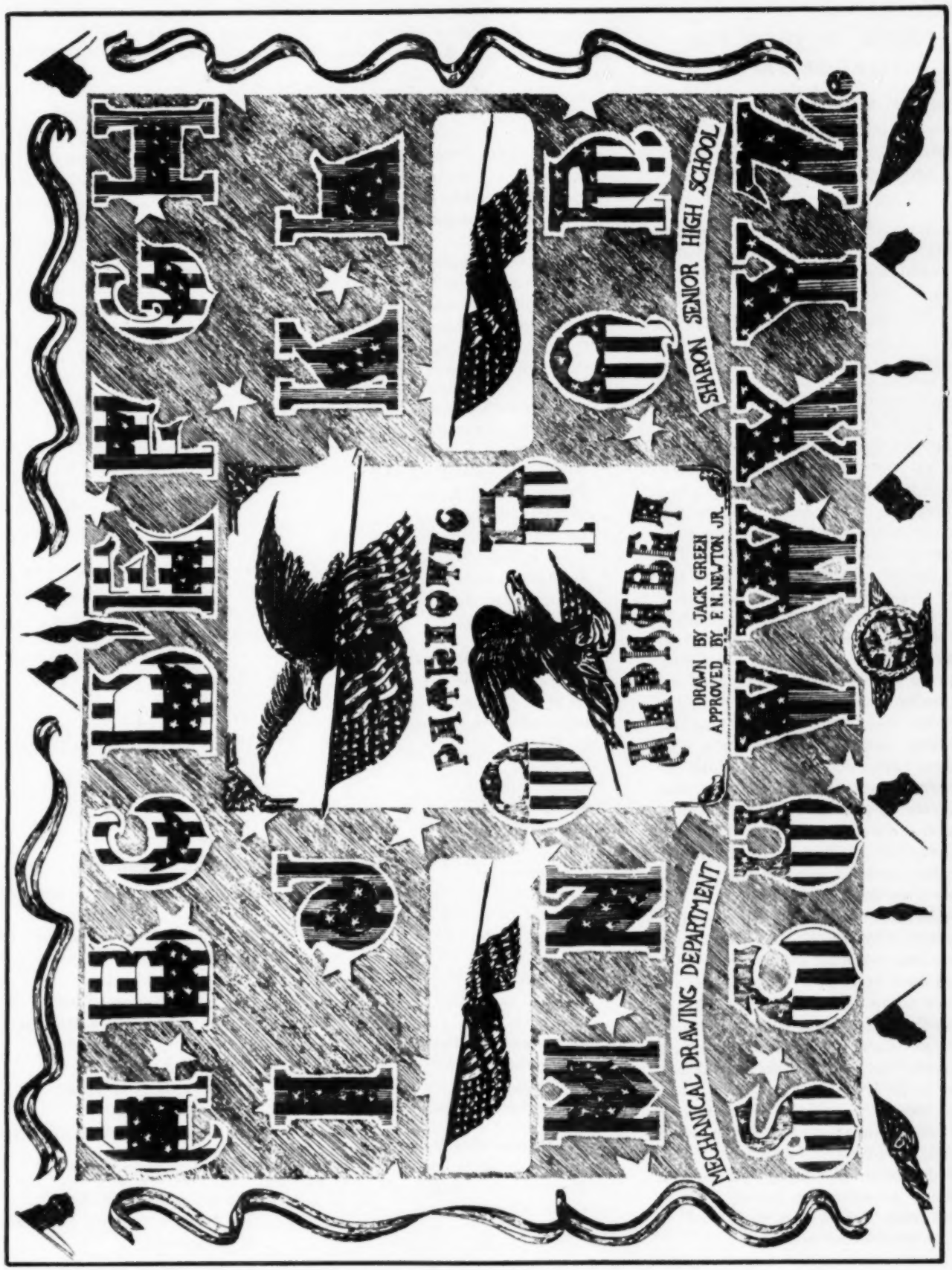
The foundry can be used to extend the activities of an existing metalworking area, under the guidance of an interested, progressive, and creative teacher, to provide a range of activity that has unlimited possibilities. If the shop facilities are limited, projects can be planned for hand tool operations. If the pupil is taught proper and skillful use of files, many simple shaper and mill operations can be performed by hand. If extensive metalworking facilities are available, the products of the foundry will lend themselves well to expanding the activities of the machine shop. Hand operations, supplemented by a metal lathe, will result in many interesting projects. A shaper and milling machine, supplementing a lathe, will bring new life and interest to a machine shop area.

The author begins work in the foundry at the eighth-grade level. Under supervision, pupils make sand molds and the instructor does the pouring of the molten metal. The projects include such items as stamp boxes, cigarette boxes, and house numbers that may be mounted on a board to involve operations in the woodworking area.

Advanced grade projects include lathe-turned candlesticks that require simple coremaking, three-part candlesticks that were designed for shaper work, pipe smoker's ash tray. meat-carving fork, teacher-designed book ends, and other projects utilizing quite extensive machine shop facilities.

It might be interesting to note that the foundry is the only industrial-arts general shop area that utilizes all of the resultant cuttings and scrap in that machine cuttings, unsatisfactory castings, spoiled castings, and all other cuttings from sheet aluminum projects can be salvaged for casting stock. Aluminum for casting can be purchased, commercially, in ingot form. Scrap aluminum alloy automobile pistons and cylinder heads provide a convenient source of supply of casting stock. These auto parts were engineered to produce the finest of machined surfaces. Good castings of this alloy will, if operations are properly and skillfully executed, result in surface finishes comparable in luster and appearance to sterling silver — beautiful projects that will be welcome and useful in the home. A good foundry, well managed, will provide worth-while educational experiences as well as interesting activity for the pupil.

In the oil industry, there are 243 companies engaged in the manufacture of lubricants and greases. — *Petroleum Newsnotes.*



Patriotic alphabet submitted by F. N. Newton, Jr., Sharon City Schools, Sharon, Pa.

COURSE OF STUDY FOR LEATHERCRAFT

ROBERT E. BERGSTROM
Instructor, Industrial Arts Department
University of North Dakota
Grand Forks, N. Dak.

Leathercraft in recent years has arisen to its rightfully important position in the industrial-arts field. The nature of craftwork in leather is such that it fits very well into the objectives of general education.

Leather is not a new innovation such as plastics, but has been known to man since before Christ. It has been found in the pyramids of Egypt, was used for money by the Romans, and was one of the first products turned to by man in his search for clothing.

Leather is an abundant commodity that is found throughout the world. This ubiquitous quality has resulted in many different methods of tanning the skins of animals. Many of these processes are peculiar to certain geographic locations, and others to different races of people. Leather in America at the present time has prolific uses: in industry, craftwork, clothing, and in the home.

With this background the need for teaching leatherwork is apparent to educators. Leatherwork allows an outlet for the innate creative ability present in most students; it presents a challenging problem but not so difficult that it becomes discouraging; it allows for the satisfaction of the aesthetic sense because of the beauty of the finished projects; it also provides for worthy use of leisure time — institutions for the physically handicapped have long recognized this fact.

Leather carving or stamping of the heavy leathers should be included in the school program because it is a true American art. Carving was originated by the Spanish who settled in the southwestern part of the United States and Mexico and was brought to its peak of development by the cattlemen of the southwest as saddle stamping. It has since become popular throughout the country being used as surface decoration on purses, billfolds, photograph albums, bookmarks, and on many other leather products.

Purpose

To acquaint the student with the importance of leather in the home, in industry, and its uses in everyday life, and to allow him fundamental experiences in working with leather.

Objectives — Over-all[1]

To develop:

1. Interest in industry.
2. Appreciation and use.
3. Self-discipline.
4. Co-operative attitudes.
5. Health and safety.
6. Interest in achievement.
7. Orderly performance.
8. Drawing and design.
9. Shop skills and knowledge.

Objectives — Specific

1. To create avocational interest in leatherwork in each student.
2. To give a working knowledge of processes found in leatherwork to each student.
3. To instill an appreciation of good design in each student.
4. To instill in each student a knowledge of leather: kinds, sources, costs, and their adaptability.

Suggested Activities

1. Have class complete one small project as an exercise including as many basic operations as possible.
   a) Key case
   b) Wallet
   c) Comb case
   d) Mirror backs
   e) Bookmarks
2. Demonstrations by instructor
3. Class discussions
4. Use of study guide questions to be answered by student
5. Project construction by students such as:
   a) Purses
   b) Desk sets
   c) Wallets
   d) Photograph albums
   e) Key cases
   f) Moccasins
6. Oral and written reports by students

Manipulative Skills

1. Plan a procedure.
2. Measure with a rule.
3. Create original designs.
4. Transfer designs.
5. Make duplicate parts.
6. Lay out templates.
7. Cut leather.
8. Cut templates.
9. Lay out templates on leather.
10. Mark leather for cutting.
11. Prepare leather for tooling or stamping.
12. Tool outlines with tracer modeler.
13. Tool for flat modeling.
14. Emboss designs.
15. Stamp designs.
16. Stipple parts of designs.
17. Dye edges and surfaces.
18. Raise designs.
19. Crease edges.
20. Skive edges.
21. Splice lacing.
22. Punch for lacing.
23. Fasten key plates.
24. Do whip stitch edge lacing.
25. Do buttonhole stitch lacing.
26. Sew leather by hand and machine.
27. Rivet with eyelets.
28. Rivet with split eyelets.
29. Set snap buttons and bag plates.
30. Pad leather.
31. Insert gussets.
32. Assemble snap buttons.
33. Cement edges and lining.
34. Clean leather.
35. Polish leather.
36. Bevel edges.
37. Assemble leather around forms.
38. Carve leather designs.
39. Use the basic saddle stamps.
40. Make waxed thread.
41. Dye backgrounds.

Related Information

1. The history and early uses of leather.
2. The preparation of leather for tanning.
3. The tanning of leather.
4. Geographical sources of leather.
5. How to differentiate between skins and hides.
6. The kinds of leather.
7. The by-products of leather.
8. How leather is sold.
9. The essential leather tools and equipment.
10. The proper care of tools.
11. The care of leather products.
12. The types of dyes and stains used in leatherwork.

[1] A.V.A. Bulletin, September 24, 1948.

13. Consumer knowledge of leather products.
14. Occupational opportunities in the leather industry.

Teaching Aids and Devices

1. Displays:
   a) Of former students' work.
   b) Of commercial uses of leather
   c) Of uses of leather in industry
   d) Of uses of leather in the home
2. Charts:
   a) Step by step charts
3. Field trips:
   a) To a tannery
   b) Shoe factory
   c) Other plants processing leather
4. Outside speaker from the leather industry
5. Pamphlets and free literature
6. Blackboard sketches

References and Sources of Supply

A. Books:

1. Cherry, Raymond, *General Leathercraft* (Bloomington, Ill.: McKnight & McKnight, 1949).
2. Dean, John W., *Leathercraft Techniques and Designs* (Bloomington, Ill.: McKnight & McKnight, 1949).
3. Grisvold, Lester, *Handicraft — Simplified Procedure and Projects* (Colorado Springs, Colo.: Lester Grisvold Pub., 1942).
4. Groneman, Chris H., *Applied Leathercraft* (Peoria, Ill.: Manual Arts Press, 1942).
5. Groneman, Chris H., *Leather Tooling and Carving* (Scranton, Pa.: Int. Textbook Co., 1950).

B. Sources of supply:

1. Brodhead Garrett Co.
   Cleveland, Ohio
2. Leather Products Co.
   PO Box No. 596
   Sioux Falls, S. Dak.
3. Russo Handicraft Supplies
   Dept. 12J 245 So. Spring St.
   Los Angeles 12, Calif.
4. Hyman Zeitlin Co., Inc.
   38 Spruce St.
   New York 7, N. Y.

Tools and Equipment

1. Skiving knife
2. Awl
3. Drive punches
4. Revolving punch
5. Thonging chisel
6. Tracer
7. Modeler
8. Deer foot
9. Ball tool
10. Snap attaching set
11. Eyelet setting punch
12. Slitter punch
13. Edge creaser
14. Eyelet setter
15. Mallet
16. Embossing wheel and carriage
17. Steel square
18. Shoemaker's hammer
19. Rubber cement
20. Assortment of snaps and bag clips
21. Lacing needles
22. Oxalic acid
23. Patterns
24. Lace — goat and calfskin
25. Leather
    a) Calfskin 3 & 4 ounce
    b) Cowhide 7 to 10 ounce
26. Dyes and stains
27. Saddle soap
28. Treeing compound
29. Leather waxes
30. Marble slabs
31. Plate glass for tooling
32. Set of saddle stamps
33. Cutting board

Evaluation

1. Observation
   a) Observe student's working habits, his progress and success in solving problems and his ability to think for himself.
   b) Observe student's attitude toward co-operation with fellow students and instructor.
   c) Observe the student and determine if he is doing any creative thinking.
   d) Watch for and evaluate his shop knowledge.
2. Testing
   a) By oral questions
   b) By frequent short quizzes
   c) By objective comprehensive examinations including:
      1) Multiple choice
      2) Alternate response
      3) Matching
      4) Recall
3. Projects
   a) Quality of craftsmanship
   b) Determine if quality is higher or lower than expected by:
      1) Comparison to other work
      2) Comparison to a general standard

NIGHT DRIVING A NECESSARY PART OF THE DRIVER TRAINING PROGRAM

MARVIN METERSKY
Corinth High School
Corinth, N. Y.

Since a great proportion of our traffic accidents occur during the dusk and night periods of the day, due consideration must be given to this fact and action taken on it.

With the coming of dusk and evening the reduced visibility often causes the driver to be misled. The coming of dusk causes the distinct shapes of cars, trucks, and pedestrians to blend in with their respective backgrounds reducing the visibility and hampering the driver's ability to judge distances and depths. Without this judgment accurate driving is difficult if not dangerous.

Driving at Dusk

How can the individual driver compensate for the reduced visibility of dusk and evening? How can a person be taught to judge distance at this period of the day? The American Automobile Association night and glare vision test is used in my school as it is used in many schools. With this test the instructor measures the student's response to a glare, by stimulating the lighting effect of an oncoming car with the high beam on. The test has some validity, and enables the instructor with some degree of accuracy to pick out certain students who have difficulty recovering from this glare.

The average driver, no matter who he may be, is temporarily blinded when a car is coming at him with its lights in the up or down position. At a speed of sixty miles per hour a car is traveling at 88 ft. per second. The danger zone in front of a car traveling at that speed is 336 ft. The danger zone is that distance in front of a car, traveling at any given speed, in which you cannot bring the car to a stop.

At the time of temporary blindness caused by the passing of an oncoming car

the driver has practically no visibility in the area directly in front of the car. As the driver recovers from the glare caused by the oncoming car his visibility increases directly with the intenseness of the light beam on his own car.

The time consumed in recovering from the temporary blindness will vary with the individual. No matter what fraction of second it takes, speed and temporary blindness may mean death on the highway.

The students in driver education must be made to realize what dusk and night driving mean. They must be tested for recovery from glare. They should understand that high speeds and night driving do not mix. The students must be made to realize that the human element in driving is the cause for the majority of our accidents and that night and dusk driving take more of the drivers on our highways than do any other type accidents.

Night Driving as Part of the Driver-Education Course

In the driver training course the instructor should take the students out at night if his particular course can allow it. Before doing any driving of this type the driver should get permission from the parents involved as well as the administration of the school.

During the class the instructor can use the information obtained from the glare vision test and help each individual student compensate for the glare of the oncoming car. The student should get into the habit of reducing the speed of the car as the lights of the oncoming car bear down on him. The student should learn the social responsibilities he takes on when driving at night. The instructor should point out to the students that the lowering of the light beam on his car is necessary and when doing so the driver's eyes should be directed to the farthest point he can see on the right hand side of the road. With this bit of instruction the students will learn that time and glare play a large role in night driving. With this experience the students will leave the driver training course with more confidence in their ability to drive at night. The driver training courses throughout the United States are reducing the number of accidents greatly. Let's eliminate the hazard of night driving and make it a pleasure rather than a constant toil with injury and death.

TRY AN ASSISTANT IN YOUR JUNIOR HIGH SHOP GROUP

ALVA A. BYARS
Industrial Arts Teacher
Horton Watkins High School
School District of the City of Ladue
St. Louis, Mo.

The idea of using an eleventh- or twelfth-grade student as an assistant to the teacher in junior high shop groups in the six-year high school or with the ninth-grade groups in the four-year high school has many possibilities. Horton Watkins High School, and surely many other schools, is using this type of program.

How the Program Works

The teacher of junior high groups takes an eleventh- or twelfth-grade student into the same class with the younger group as his assistant. This will prove invaluable to the teacher in saving of time for these younger students. These junior high students need a great amount of actual help in addition to teacher techniques. Their co-ordination has not developed to the point that skill with tools is not quite difficult for them. The assistant to the teacher can easily take over many of these duties leaving the teacher free to do actual teaching, demonstrations, etc. The task of getting out material for the students may be accomplished by the assistant. Some other duties of the assistant can easily be sharpening and adjusting tools for the young students, performing operations on power tools which are difficult with hand tools, and help check tool panels at cleanup time.

Student Values

This type of program sounds very much like exploitation of the students but in reality the benefits received by the student assistant far outweigh any exploitation. These student assistants acquire a very keen sense of responsibility toward other students. They learn to respect the ideas of others and to help them formulate proper ideas and attitudes.

Self-reliance and self-discipline are traits which are built to a very large degree. The student is exposed to the teacher's side of school life and produces in the student a greater understanding and appreciation of school life as a whole.

This is excellent training in leadership since the emphasis of such training is in the leading of younger students. Such experience creates excellent self-confidence which will carry over into adult life. The obtaining of this type of self-confidence is particularly valuable since it is obtained through guiding others and is coupled with respect for the ideas of others. This type of program helps to strengthen the planning ability of the student assistant since he must help these younger students to plan their work. He must not only know how to plan but be able to defend his method against attack from the younger student.

Selection of Student Assistants

The selection of those students who are to be assistants is an important phase of the program. First in importance of the traits desirable for student assistants is that of maturity. The mature student will take the problems that arise in the classroom in stride and easily adjust to new situations and will not become upset by the behavior of these younger students.

The student assistant must have skill with tools and be thoroughly familiar with both tools and materials. Tool processes are also a must for the student assistant and his skill must be well above average. The student assistant must be familiar with the machines and machine processes.

It is quite important that the shop teacher chooses this student assistant and that he not be assigned by the administration. This student must be a definite asset to the shop class or he will be of little or no value to the teacher.

In a check on 1007 automobiles, conducted by the California Highway Patrol, it was found that the concentration of carbon monoxide in 3 per cent of the cars exceeded the maximum safe limit. Causes were listed as faulty exhaust systems, head gaskets, or manifolds in all of the cases.

The tests revealed that opening car windows is no solution. In fact, in many cases, the concentrations of carbon monoxide proved *higher* when several windows were open than when all windows were tightly closed. — *Action for Safety*

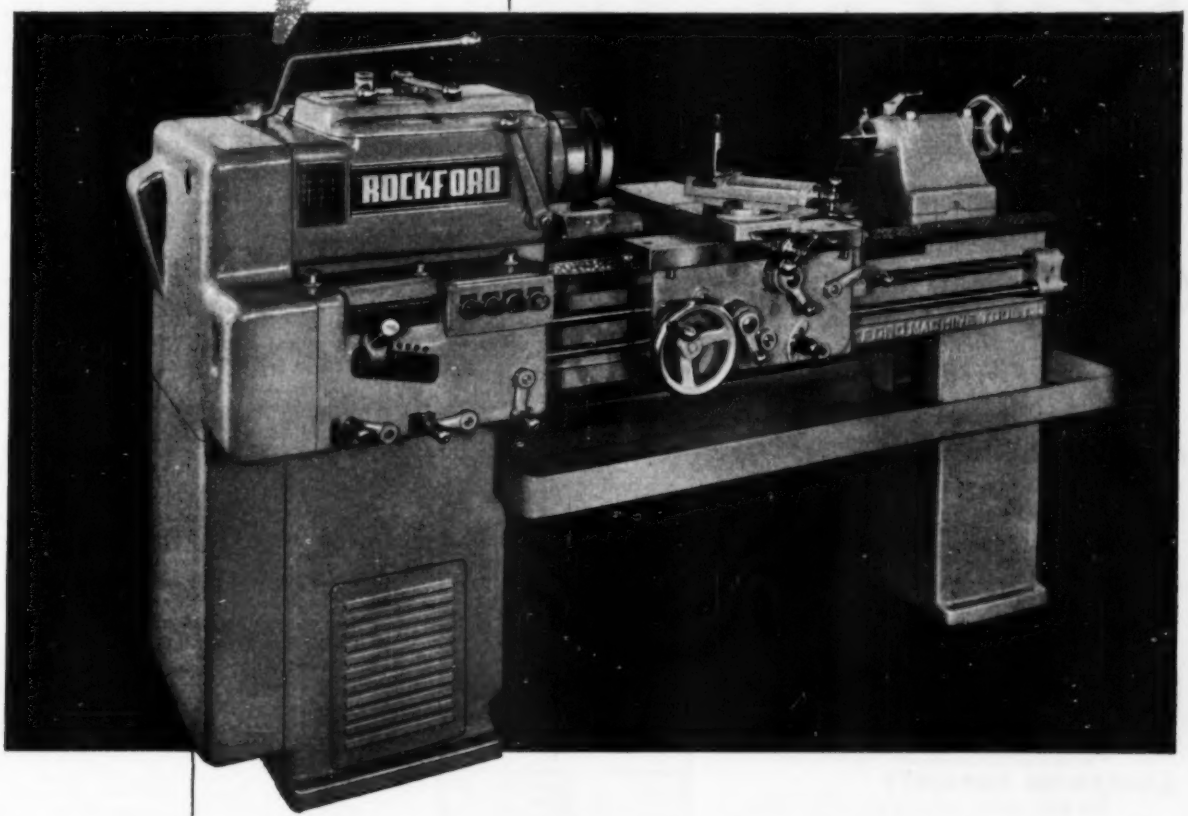
By 1960, it is estimated that the United States will rely on oil and natural gas for about two-thirds of its energy. — *Petroleum Newsnotes*

*Check List for

PRACTICAL LATHE TURNING

* BIG ACCURATE LEAD SCREW
INDEPENDENT FEED SHAFT
BIG PRECISION TIMKEN BEARING SPINDLE
HEAVY TAIL STOCK, ANTI-FRICTION THRUST BEARINGS
PRECISION HOBBED AND SHAVED HEADSTOCK GEARS
TOOL ROOM ACCURACY, ZERO PRECISION BEARINGS, PRODUCTION POWER, 5 H.P. DRIVE MOTOR
ALL GEARED HEAD, QUAD-V-BELT DRIVE
HEAVY CUTS, 16" OR 18" SWING, 30" CENTER DISTANCE
6' BED, DOUBLE-WALL APRON, 3100 LBS. TOTAL WEIGHT

either tool room or high production



Rockford Lathes offer you all of these production features, with modern design, ample dimensions and high quality materials.

Ask a Rockford Machine Tool Co. Representative to give you full details on the practical production advantages of these heavy service, medium sized, economy priced machines.

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ROCKFORD ECONOMY LATHES—16" and 18"

ROCKFORD MACHINE TOOL CO.
2500 KISHWAUKEE STREET • ROCKFORD, ILLINOIS

ASSOCIATION NEWS

(Continued from page 8A)

The main address, "The Teacher and Industrial Arts," will be given by Dr. Kenneth W. Brown, director of industrial arts, New York State College for Teachers, Buffalo, N. Y.

On Saturday, November 7, at 9:00 a.m., the topic, "Industrial Arts Materials and Processes," will be featured.

Robert D. Goldman, head, department of fine and industrial arts, Abraham Lincoln High School, Philadelphia, will be the chairman.

F. N. Newton, Jr., director of industrial arts, Sharon, Pa., will be the chairman at the 12:30 p.m. luncheon on Saturday.

Fred J. Finsterbach, educational director, Walker-Turner Division of Kearney and Trecker Corporation, will speak on "Planning the General Shop."

The business meeting will be held at 2:30 p.m. — *J. Philip Young, President.*

AMERICAN PERSONNEL AND GUIDANCE ASSOCIATION

The first convention of the American Personnel and Guidance Association will be held at the Conrad Hilton Hotel, Chicago, Ill., March 29 through April 2.

The theme for the convention will be "Human Resources and Manpower Utilization." Keynote speaker will be Robert J. Havighurst, professor of education, and chairman of the Committee on Human Development, the University of Chicago.

This organization is successor to the Council of Guidance and Personnel Associations. Robert H. Shaffer, assistant dean of students, Indiana University, is president.

NEW YORK STATE FIRE TRAINING

Five Years of Progress in Fire Training was the keynote of New York State's 5th Annual Fire Instructors Conference held in co-operation with the Buffalo, N. Y., fire department, October 5 to 9, 1953.

The conference was conducted under the direction of State Division of Safety Director Thomas W. Ryan and B. Richter Townsend, chief of its Bureau of Fire Mobilization and Control.

The conference this year was held in three sections, two of which met in Buffalo, N. Y., while the third met in Elmira, N. Y.

Fire Commissioner Harold R. Becker of Buffalo made available the facilities of his department for the 5th Annual State Fire Instructors Conference.

AMERICAN INDUSTRIAL ARTS ASSOCIATION CONVENTION

The new Statler Hotel, located in the heart of the city of Los Angeles, will be the center of activity during the national convention of the American Industrial Arts Association, March 23 through 27, 1954.

The Statler's strategic central location offers easy access by freeway and other forms of transportation to schools and industries in the metropolitan district and points of interest in the entire southern California area.

The five-day session for the professional meeting is packed with outstanding programs including many nationally recognized speakers, workshops, school and industry visitations, and exhibits. Industrial arts will be approached from every level — elementary school through college. College students, future industrial-arts teachers, will make presentations during the conclave.

In addition to the large number of school exhibits planned, the Ship organization of commercial exhibitors is planning one of the largest exhibitions of school equipment and supplies in recent years. Relatively few national conventions come to the West Coast and this factor, plus the excellent exhibit facilities of the Statler Hotel, insure an outstanding opportunity to appraise the latest in educational and training facilities offered by manufacturers.

High light of the closing evening of the convention will be the annual Ship's program, also sponsored by commercial exhibitors.

A full program has been planned for the ladies, including luncheons, fashion shows, tours, and visits to studios.

Saturday, March 28, has been designated "Santa Barbara Day." The Alpha Beta Chapter of Epsilon Pi Tau at Santa Barbara College, of the University of California, will conduct an initiation meeting and sponsor a noon luncheon and evening barbecue on the college grounds. Special tours and entertainment have been planned for the ladies. The industrial-arts department at Santa Barbara College, which provides all industrial-arts teacher training within the University, will be in operation and special tours have been arranged.

Present indications are that this will be the biggest and most profitable AIAA Convention to date. Plan now to be in Los Angeles in March. It is *the* event of the year for industrial-arts educators. — *Thomas S. Weir.*

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above all else in school lathes

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. . . all belts, pulleys, countershafts, gears and motors are completely enclosed. Speed changes and gear-ratio changes are made by external shift levers.

★ **SHELDON PRECISION**
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SHELDON-taught students are ready to operate standard industrial lathes—are familiar with standard controls and the "big lathe feel".

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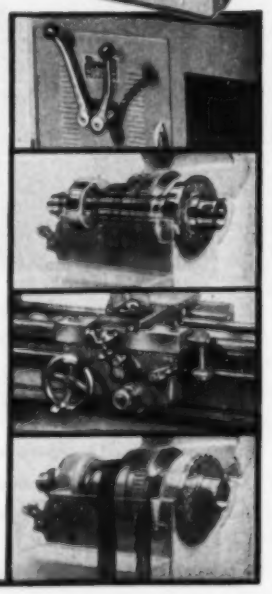
The extra swing and greater collet capacity increase the range of possible student projects—from the "playing store" group to the practical. The extra power to the spindle, the speed range, weight and strength of SHELDON Precision Lathes permit heavy cuts, spinning and demonstration of correct use of new cast-alloy and carbide-tipped cutters.



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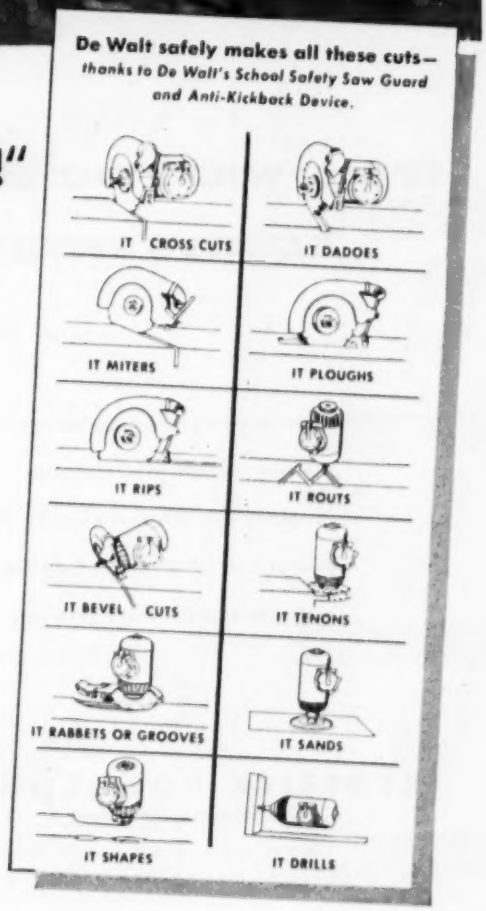

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Personal News

RONALD W. KENT RETIRES

Dr. Ronald W. Kent, director of the Essex County Vocational Schools, Newark, N. J., has requested retirement effective September 1, 1953.

Dr. Kent's resignation after 28 years in this system and 35 years in vocational education comes as a surprise to many. It is his desire to retire while young enough and in good health so that he can build a new and less exacting program which will include more time for study and play and probably some writing. He expects to do some part-time teaching and to travel in this country and possibly abroad. He is planning to take a more active part in voluntary social service activities.

Dr. Ronald W. Kent

He was born at New Albany, Ind., and was graduated from Indiana University as a chemist. He subsequently studied at the University of Minnesota, Columbia University, and New York University, receiving the degree of doctor of philosophy from New York University in 1931. Before coming to the Essex County Vocational Schools as assistant director in 1925, he had four years of industrial experience and two years as a high school teacher and principal before accepting a position at Dunwoody Institute in Minneapolis under Dr. Charles A. Prosser.

During World War I, Dr. Kent served in the navy as a Chief Machinist Mate and an Ensign in naval aviation. Following this experience, he became a supervisor of training in the rehabilitation division of the Federal Board for Vocational Education in Washington. While in this position he visited schools and rehabilitation centers for disabled veterans throughout the United States and in Canada, and established many centers for veterans. He left this position to become for three years director of the American Vocational Institute and the American Business College in Minneapolis.

Dr. Kent belongs to numerous educational and civic associations and has been active as an officer and on committees at local, state, and national levels. He has since 1945 served as a member of the national rehabilitation and education advisory committee to the administrator of the Veterans Administration in Washington. He has taught at the University of Montana, New

(Continued on next page)

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In every detail the finest screw drivers that can be made. Handles are of tough black plastic, shockproof and practically unbreakable. Comfortable Octo-Grip shaping prevents rolling and provides maximum turning power. Blades are of fine alloy steel with entire bar electrically heat treated under precision automatic control for greatest strength and toughness. Snap-on Octo-Grip screw drivers are available in a complete range of sizes and tips. Special purpose screw drivers for all industrial needs.
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PERSONAL NEWS

(Continued from previous page)

York State Normal School at Oswego, Ohio State University, Pennsylvania State College, and New York University.

In 1925 Dr. Kent became assistant director of the Essex County Vocational Schools and in 1944, when Robert O. Beebe retired, he was made director. He feels that his principal lifework has been in his 28 years of service here in Essex County. He is proud of the privilege that has been his of taking a leading part in the growth and development of both a vocational technical high school and a posthigh school program that are recognized as second to none in this country.

GEORGE W. MORGENROTH APPOINTED TO POSITION

The board of education of the Essex County Vocational Schools, Newark, N. J., at their regular meeting of April 28, announced the appointment of George W. Morgenroth to the position of director to succeed Dr. Ronald W. Kent.

Mr. Morgenroth has been assistant director since 1947, and prior to that served the schools in various capacities. Starting in 1933 as instructor of manufacturing practice in the Newark School, Morgenroth was appointed assistant supervisor of War Production Training in 1940, and in 1942 was advanced to supervisor which position he held until 1945 when the program was completed. At that time he was appointed special supervisor at the central office. During the summer of 1946 he was appointed acting secretary of the board and supervisor of special educational activities.

George W. Morgenroth

Born in Harrison, N. J., he attended local public schools, Central High School, and the Fawcett School of Industrial Arts, Newark, N. J., after which he completed an apprenticeship as a tool and die maker at the Hyatt Bearings Division of the General Motors Corporation in 1923. He received the bachelor of science degree in Mechanical Engineering from Cooper Union in 1928, and the bachelor of science degree in education from Rutgers University in 1945. He was granted the master of art's degree in education from New York University in 1946 and he is presently a candidate for the degree of doctor of philosophy at this same institution.

Prior to coming to the Essex County Vocational Schools, Mr. Morgenroth was employed as a supervisor and manufacturing engineer at the Kearny plant of the Western Electric Company. He also was employed as an engineer-draftsman at Worthington Pump & Machinery Corporation and assisted in the development of the laboratories of the Edison Lamp Works of the General Electric Company.

He has been active in a number of professional and civic organizations and recently served as president of the New Jersey Vocational and Arts Association and the New Jersey Section of the American Vocational Association. Presently he is national secretary of the National Council of Local Administrators of Vocational and Practical Arts Education and is serving as a member of the Technical Education Committee of the North Atlantic Regional Conference of the U. S. Office of Education and the State Department of Education Advisory Committee for Practical Nurse Training. He holds membership in a number of national, state, and local educational associations and has taken part in the local activities of the American Red Cross, the Community Chest, and the Boy Scouts of America.

PHILIP H. HANEY NAMED ASSISTANT DIRECTOR

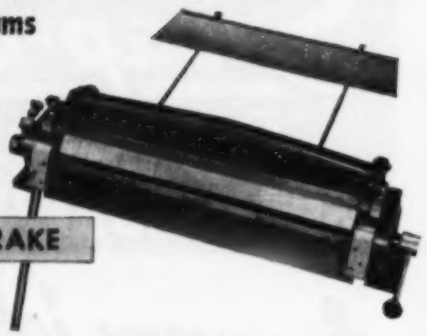
The board of education of the County of Essex has named Dr. Philip H. Haney as assistant director of the Essex County Vocational and Technical High Schools, Newark, N. J.

Dr. Haney has been supervisor of instruction and teacher trainer since 1951. Previous to that he was supervisor of apprenticeship, and part-time and evening instruction. Before assuming the latter post in 1945, he held the position of assistant

(Continued on page 26A)

BERKROY 24" SHEET METAL TOOLS

Enlarged Training Programs Possible With These Production Tools of Advanced Design



24" BOX AND PAN BRAKE

Turning a knob provides infinite adjustment to any angle from 0° to 135°. Forms any size box or pan from ½" to 24" by ¼" graduations. Makes intricate folds, reverse bends and radius bends on sheet steel up to 16 gauge and up to 24" wide. Bending leaf operates on Torrington Needle Bearings. Full 1" clearance between top fingers and anvil. Maximum 2½" box or pan depth permits deeper bends.

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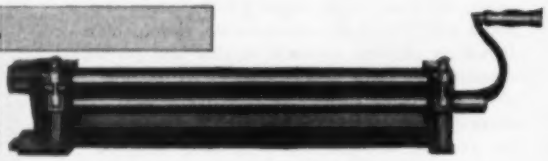

Finger-tip controls on both ends of top roll permit quick adjustment for any material thickness within capacity of unit. Will accurately roll 24" widths in 20 gauge mild steel—heavier gauges in narrower widths. Removal of work is easily accomplished due to the spring loaded, hinged, top roll. Heavy duty rolls 1½" diameter—distortion proof channel iron base, enclosed gears and oilite bearings are a few of many features.

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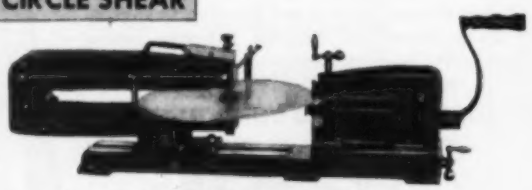

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PERSONAL NEWS

(Continued from page 24A)

supervisor of War Production Training from 1943 to 1945 and supervisor of N.Y.A. related instruction from 1941 to 1943. He taught related technical subjects in the Essex County Vocational and Technical High School from 1939 to 1941.

Born 42 years ago at Carbondale, Pa., Haney was educated at Stroudsburg (Pa.) High School. He completed a drafting apprenticeship in the Schenectady, N. Y., plant of the General Electric Company in 1932, and received his bachelor of science degree in mechanical engineering at the Georgia School of Technology in 1937. His master's degree in education was granted by New York University in 1942, and the degree of doctor of education was conferred by Rutgers University in 1949.

Philip H. Haney

Before coming to the Essex County Vocational and Technical High Schools as an instructor, Haney served as an engineer in various departments of the General Electric Company where he completed both the engineering test and the business administration course for engineers.

In addition to membership in various professional, educational, and civic organizations, Dr. Haney has served as president of the Civic Clubs Council of Newark and president of the Reciprocity Club of America. He has functioned as chairman of such civic activities as the "I Am an American Day" program, Newark's Fourth of July Celebration and Newark's Youth Week program, and has actively participated in the fund raising campaigns of the Newark-West Hudson Community Chest, the American Red Cross, the Boy Scouts of America, and the West Essex Community Chest. He is currently chairman of the American Cancer Society Campaign in North Caldwell and is a member of the borough council.

DR. KERMIT A. SEEFELD

On July 1, 1953, Dr. Kermit A. Seefeld was appointed to take the place of Dr. Lynne C. Monroe as chairman of the industrial-arts department at Santa Barbara College. It is customary for the University to rotate the responsibilities of the chairman of the industrial-arts department on a three- to five-year basis.

Dr. Seefeld acquired his B.Ed. degree in 1932 at Oshkosh State Teachers College, Oshkosh, Wis. He attended summer school, 1935–36, at the

Kermit A. Seefeld

University of Minnesota, Minneapolis, Minn.; at the Chicago Art Institute, Chicago, Ill., in 1937; at Princeton University, Princeton, N. J., 1938.

He received a M. of Ed. degree in 1946 at the Colorado A. & M. College, Fort Collins, Colo.

He attended the University of Southern California, Los Angeles, Calif., in 1946–47; and received the D. of Ed. degree after attending Stanford University, Stanford, Calif., in 1948–49.

He taught at the Milwaukee Public Schools from 1932 to 1946; and taught part time at the Shorewood Opportunity School (adult education), 1934–41; Engineering Scientific Management War Training Program, 1941–45.

He was visiting professor at the Colorado A. & M. College during the summer sessions of 1939, 1940, 1941, 1947, and 1952; and at the Montana State College, Bozeman, Mont., in 1945 and 1952. He was associate professor at Santa

(Continued on page 28A)

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C & P presses and paper cutters have been standard equipment in commercial plants and schools for over 50 years. So, the selection of C & P equipment for printing classes places before the students *practical* equipment exactly as used in commercial practice in the entire printing industry.

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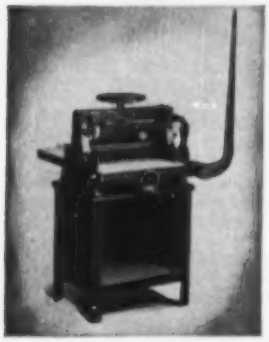

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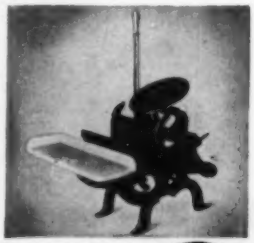

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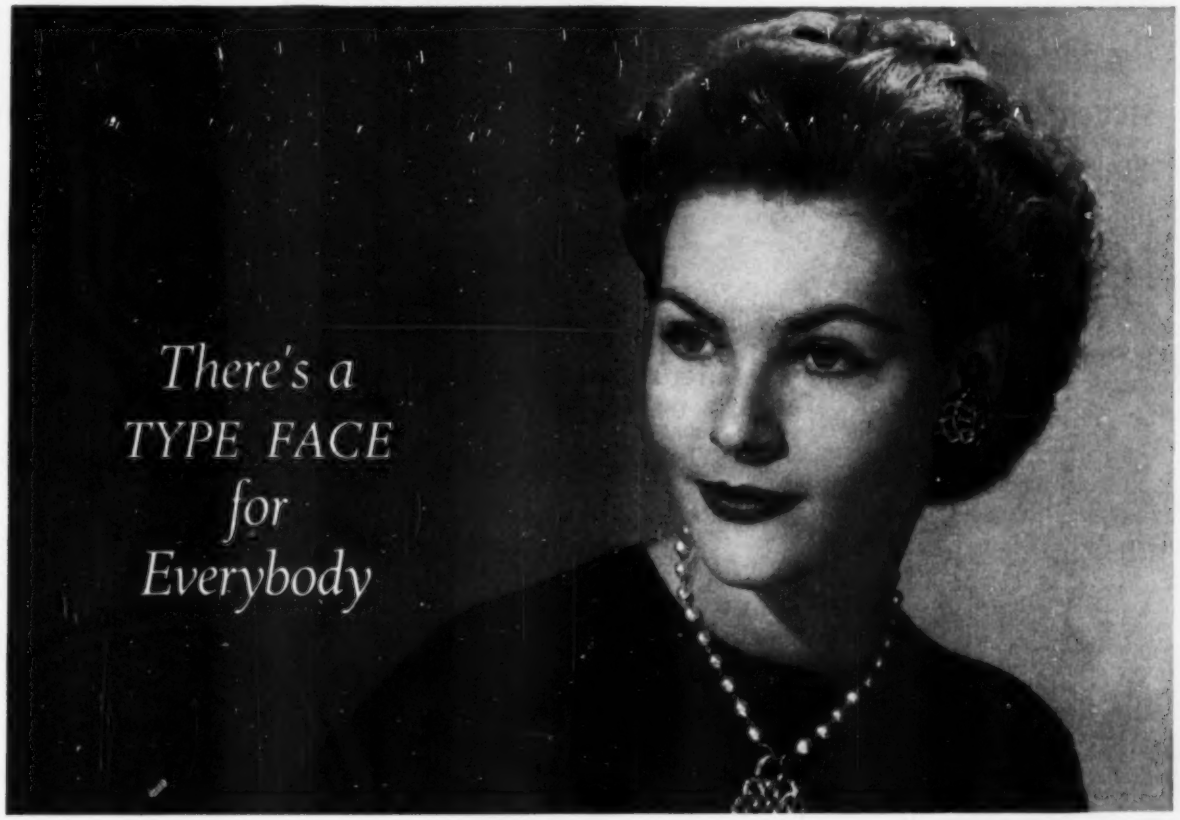

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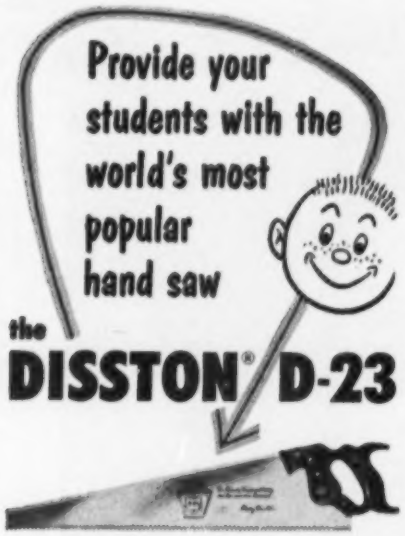

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And there's a bonus to the school that chooses this fine saw—or any Disston tool! Disston saws and tools serve longer, need fewer replacements. Keep DISSTON in mind when you make your next requisition!

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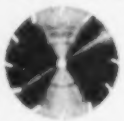

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PERSONAL NEWS

(Continued from page 26A)

Barbara College, University of California, 1946 to date; and chairman, department of industrial arts at this institution since July 1, 1953.

He is a member of Kappa Delta Pi, Phi Delta Kappa, Epsilon Pi Tau, Iota Lambda Sigma, Alpha Phi Omega, Delta Tau Delta, American Association of University Professors, American Industrial Arts Association, California Industrial Education Association, National Association of Industrial Arts Teacher Trainers, Kiwanis Club of Santa Barbara, and Inter-Service Club Council.

WALTER E. DURBAHN RETIRES

Walter E. Durbahn resigned from the Deerfield Township High School, Highland Park, Ill., in June, 1953, where he was the chairman of vocational education, supervisor of apprentice training, and the building trades instructor.

Graduated from the New Ulm, Minn., high school, 1912; The Stout Institute, 1915; B.S. degree from Northwestern University in 1935; and M.A. in education in 1943.

Walter E. Durbahn

He taught industrial arts at Stewartville, Wadena, Bemidji, and Mankato, Minn., before coming to Illinois in 1925. He resigned from a principalship at Mankato to organize vocational building trades at Highland Park High School. During these 28 years his students have erected buildings valued at over $400,000, nine houses, an auto-mechanics building, a field house, Sandwick Hall, a shop and classroom building, and a five-stall bus garage building for the school. The house built in 1931 won the national first prize in the Better Homes in America Campaign. The house completed in 1951 was featured in *Living for Young Homemakers* magazine.

He is the author of two carpentry books and a Home Workshop book, and has originated and is the talent on Walt's Workshop television program, a WNBQ-NBC production. This program is designed to teach and encourage young and old to use their hands to create. The show has been on the air almost five years and has the record of being the longest continuously sponsored TV show by the same sponsor. Future plans are to continue with the TV work, write a book on carpentry for the homeowner, continue as associate editor of *Homecraft* magazine, and as technical editor of *Home, Maintenance and Remodeling* magazine. He says that he will also do some traveling and a bit of fishing.

(Continued on page 31A)

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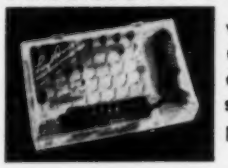

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Sizes ⅛" to 2"

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The blade and shank are forged from *one piece* of special analysis steel, extending almost through entire handle to meet steel cap. Blows struck on head are transmitted directly to the cutting edge. Blades are heat treated, tempered and machine cross-ground . . . have a keen cutting edge and hold it. Handles of tough plastic are assembled to the blade shank.

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Instructor, Division of Industrial Education
*State University

NEW 32 PAGE BOOK contains 12 projects to aid the Metalworking Instructor!

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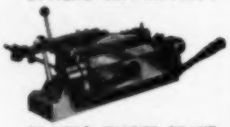

DI-ACRO FINGER BRAKE

DI-ACRO ROLLER

This booklet is designed to illustrate projects which include in their construction common metalworking operations that are readily performed on the Di-Acro Machines best adapted for use in the school shop—Rollers, Brakes and Benders.

These Di-Acro Machines are versatile, are made in sizes which are suitable for the small school shop, and are of sound construction which should appeal to school shop instructors and supervisors. Complete information on Di-Acro Rollers, Brakes and Benders is contained in the booklet.

*Name on request.

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351 Eighth Avenue
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PERSONAL NEWS

(Continued from page 28A)

VICTOR J. SMITH HONORED

Victor J. Smith, professor of industrial education (retired) of the Sul Ross State College, Alpine, has recently been made a Fellow in the American Association for the Advancement of Science. Mr. Smith is also a Fellow in the Texas Academy of Science and the American Anthropological Association in recognition of his studies related to the arts and crafts of the West Texas Indians.

♦ JOSEPH STROBEL, assistant commissioner for vocational education in the U. S. Office of Education, resigned to take a post in the New York State Education Department.

♦ DEAN JOE L. JESSUP of The George Washington University, Washington, D. C., has been appointed as a trustee of the Training Within Industry Foundation.

Professor Jessup's services were sought by the Foundation because the organization is expanding its work in advanced management training and executive development programs. As assistant dean of the GWU School of Government and as Coordinator of the University's Air Force Manpower Management Training Program, Professor Jessup had been responsible for the development and operation of a concentrated course in advanced management which has been given to more than 1100 senior United States Air Force commanders, ranging in rank from lieutenant colonel through major general, since 1951.

♦ EDWARD V. MOCHEL, a 1951 graduate of Illinois Tech, was appointed instructor in technical drawing, and William D. Diemer, who received his master's degree from the University of Chicago, was named instructor in mechanics at the Illinois Institute of Technology, Chicago, Ill.

♦ BENJAMIN J. NOVAK, formerly at Murrell Dobbins Vocational-Technical School, Philadelphia, Pa., is now head of the science department at Frankford High School, Philadelphia.

Mr. Novak is also lecturer in vocational education at Temple University, Philadelphia.

♦ N. B. GILES has been appointed assistant chief on the staff of trade and industrial education, Office of Education, Washington, D. C.

Other changes are: Walter H. Cooper has been made program specialist for the Central Region, and E. G. Ludtke, for the Southern Region.

Howard K. Hogan has been appointed consultant of employees-employer relations.

♦ BILL HEHLI, graduate of The Stout Institute, Menomonie, Wis., and former industrial-arts teacher at Mondovi, Wis., has been acting superintendent of the Mondovi Schools since the death of Chester L. Dodge.

♦ A memorial fund for I. David Cohen, late principal of George Westinghouse Vocational High School, has been established to "perpetuate his ideals and pioneer work in the field of vocational education and guidance."

♦ LARRY MOSHER teaches in the Harmony, Minn., High School. He teaches four classes of industrial arts and one class of driver training. He also coaches the "B" squad of football and basketball.

News Notes

♦ A two-year graduate research fellowship has been established at Illinois Institute of Technology, Chicago, Ill., by Clark Brothers Company, Olean, N. Y., engine and compressor manufacturers.

The $6,000 grant has been awarded to William E. Thompson, former instructor in mechanical engineering at Illinois Tech, to complete his doctoral research on flow problems of centrifugal compressors.

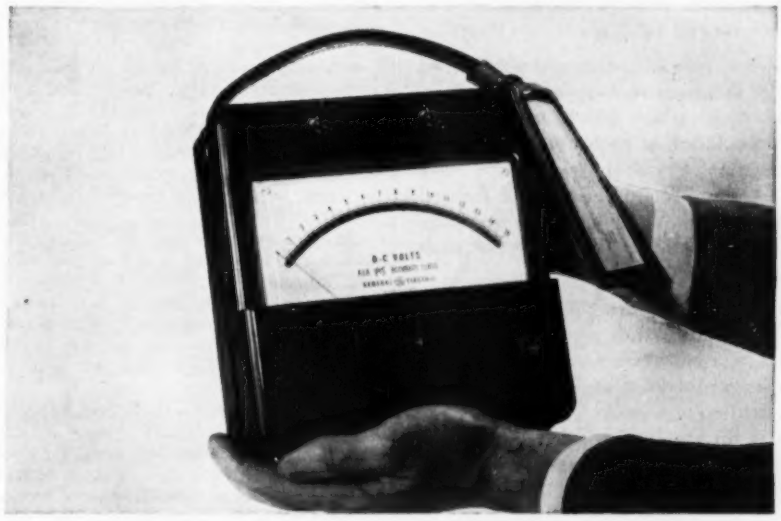
The company also is furnishing equipment for the research, including a 200 horsepower motor, speed-increasing gear and motor controller.

Upon completion of his doctoral program, Thompson plans to return to the I.I.T. faculty.

♦ The New Jersey Farm Electrification Council, in co-operation with the Extension Service, sponsored electric project training in all 4-H camps in the state this summer. Campers who selected electric training received instruction in wire splicing, safety, meter reading, identifying and rating electrical equipment, and the history of electric power. They also made an extension cord and a pin-up lamp.

♦ A new 48-page 4-H Club Farm and Home Electric Project Handbook has been published by the Alabama Extension Service. The manual outlines the program and provides the basic information needed to complete the project. Sub-

(Continued on next page)



General Electric announces new line of high-accuracy portable d-c instruments

HIGH-ACCURACY—General Electric's new DP-12 portable instruments feature accuracy of ¼ of 1% of full scale. For less critical applications new DP-11 instruments have an accuracy of ½ of 1% of full scale. Voltmeters, millivoltmeters, ammeters, milliammeters, and microammeters are available in a wide range of ratings.

STURDY CONSTRUCTION—spring-mounted jewel bearings provide for maximum protection against damage from shock. Strong, break-resistant extra heavy Textolite* case encloses the instruments.

BETTER SCALE ILLUMINATION—new molded window assures best lighting of the instrument's large 5¼-inch wide-open scale for fast, correct readings.

IMPROVED TERMINALS—terminals are located at the rear of the instrument, away from the operator. This arrangement provides both convenience and safety for the operator. New design accommodates a greater variety of connecting leads.

Further information about General Electric's new DP-11 and DP-12 instruments may be obtained from your nearest G-E Apparatus Sales Office, or write for bulletin GEC-979, General Electric Co., Section 688-2, Schenectady 5, N. Y.

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NEWS NOTES

(Continued from previous page)

jects covered include the story of electricity, good lighting, lamp shades, lamp making, wiring, electrical equipment the 4-H'er can build, joints, splices and connections, and electrical safety.

♦ Farm boys in the state of California took 15 of a total of 100 cash awards in The James F. Lincoln Arc Welding Foundation's 1952–53 annual Arc Welding Award Program. This was the best performance by boys in any one state. The Foundation's 1952–53 awards were made to high school farm boys in 27 different states throughout the country for their descriptions of how arc welding is or could be used in farming.

The Foundation is sponsoring a similar Award Program for the 1953–54 school year. It is open to all high school students living on farms or ranches. A Rules booklet telling how to enter and showing pictures of previous award projects is available from *The Lincoln Arc Welding Foundation, Cleveland 17, Ohio.*

♦ Three-dimensional motion pictures will uncover visual defects in many school children, according to Dr. T. R. Murroughs, associate professor of psychology, Northern Illinois College of Optometry. He also predicted that such films will be prescribed, under controlled conditions, to help establish proper seeing patterns for cross-eyed children.

"A child ordinarily may not be aware of the fact that he doesn't see as well as other children," Dr. Murroughs said. "When he attends a three-dimensional movie, he may fail to see those depth effects which his friends enjoy. This may make him realize that his eyes are not functioning properly and prompt him to seek proper attention."

Poor acuity in one or both eyes, muscular imbalance and poor judgment of space and distance were other shortcomings mentioned, the discovery of which might come as a result of inability to get the most out of three-dimensional pictures.

"The difficulties discovered are likely to be of types not correctible by glasses," he said. "Scientific visual training, or orthoptics, is prescribed in these cases to use both eyes together. Those seeing patterns which will enable a child to enjoy three-dimnsional pictures are established by means of these techniques. After proper training, viewing three-dimensional pictures can help fix these patterns in a cross-eyed child."

♦ The House of Representatives, with a vote of 123 to 61, approved an amendment by Congressman Barden of North Carolina which prevented a proposed cut of $4,624,391 in vocational appropriations.

♦ President Eisenhower signed into law the Carlson-St. George aid to permit mailing of educational films and related material at book rates.

♦ By next spring the nation will have at least 5,000,000 young men and women who have been trained in high school to be safe drivers, according to the Association of Casualty and Surety Companies. Top honors among 23 states named as recipients of plaques in its Sixth Annual Driver Education Award Program had been shared by Oklahoma, Delaware, and Massachusetts.

♦ It is exceedingly heartening to the friends of vocational education that the federal vocational appropriation will not be cut as was previously decided, but that it will be the same as last year.

Ask your congressman for: Hearings Before the Subcommittee on Appropriations, U. S. Senate, 83rd Congress, Session on H.R. 5246. Also the Congressional Records of May 19, 21, and 22.

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NORMAN E. HINES, Luther Burbank Jr. H. S.
Los Angeles, California

VICTOR L. SILVERIA, Louis Pasteur Jr. High
Los Angeles, California

RICHARD J. HERZING, Sequoia High School
Redwood City, California

JAMES F. NIHART, Verdugo Hills H. S.
Tujunga, California

RICHARD A. TERRY, Milford High School
Milford, Connecticut

JOHN PICKETT, Warner Jr. High
Wilmington, Delaware

WESLEY AHLBERG, Calumet High School
Chicago 20, Illinois

ROBERT E. ASHLEY, Calumet High School
Chicago 20, Illinois

A. J. HEINMILLER, Washburne Trade & Voc.
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P. R. ROHE, J. S. Morton High School
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DAVID E. GESKE, St. Paul Vocational
St. Paul 1, Minnesota

JAMES N. LONGWELL, Union Endicott High
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Westbury, L. I., New York

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JED W. WASDEN, Midvale Junior High
Midvale, Utah

WALLACE R. HANSEN, South High School
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These winning teachers listed above gained deserved recognition for their schools, their students and themselves—both nation-wide and in their own communities! They were invited, expense-free, as 3-day guests of Ford Motor Company in Detroit to be honored at the Annual Awards Dinner, and see the sights of the industrial capital of the world! You can do the same thing!

The winning projects shown here are merely three of over 1400 winners, covering every type of industrial arts—and all with awards! Any of your students, from the 7th to the 12th grades, is eligible . . . the project he's working on NOW may be a winner!

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Last year there were over 5,000 entries from more than 1,000 schools—enthusiasm at its best! You can create greater classroom enthusiasm by telling your students about I.A.A. *now*. For more information, write to: Industrial Arts Awards, Ford Motor Company, 3000 Schaefer Road, Dearborn, Michigan.

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These STUDENT PROJECTS Won Industrial Arts Awards in 1953!

LEATHER HANDBAG produced by Outstanding Achievement Award winner, Bruce Hand, age 15, Grade 9, Midvale Junior High, Midvale, Utah.

SILVER PENDANT AND CHAIN won Outstanding Achievement Award for Carol Shermer, age 13, Grade 8, Roosevelt Junior High, Philadelphia, Pennsylvania.

DINING ROOM TABLE built by Outstanding Achievement Award winner, Sibley Smith Jr., age 17, Grade 11, Hill School, Pottstown, Pennsylvania.

INFORM YOUR STUDENTS ABOUT THE 1954 I.A.A. PROGRAM—THE PROJECTS THEY'RE WORKING ON NOW MAY BE WINNERS!

INDUSTRIAL ARTS AWARDS

New Publications

Elements of Heat Treatment

By the late George M. Enos and William E. Fontaine. Cloth, 286 pp., 6 by 9¼ in., illus, $5. John Wiley & Sons, Inc., New York, N. Y.

The authors of this book were well qualified, by practical and teaching experience, to produce this text.

It will be found helpful by engineering students, mechanical engineers who want to refresh their memories on what they had learned in their college days, and by designers who have to decide what metals must be used for certain purposes.

The book discusses in simple language, the nature of metals and alloys, the mechanical properties of metals, steel, the mechanical working of metals, annealing and normalizing, hardening and quenching, tempering, hardness of steels, alloy steels, surface hardening of steel, cast irons and their heat treatment, heat treatment of nonferrous metals and alloys, equipment and methods used in heat-treating practice.

The book contains numerous technical illustrations, and many interesting and humorous cartoons depicting what the metals undergo while being heat treated.

Industrial, Labor and Community Relations

Cloth, 174 pp., 8 by 10¼ in., illus., $3.75. Plastic bound, $2.75. Publications Committee of the New York State Vocational and Practical Arts Association. Delmar Publishers, Inc., Albany, N. Y.

This is an excellent text for the students who, as our future employees, should know about industrial, labor, and community relations. The material has been divided into 26 units and an appendix.

In these units the student is introduced to apprenticeship; organization of society; personal security and efficient living; individuals, unions, and employers; government; and democracy.

A bibliography of books, pamphlets, and other materials make up the appendix.

The men who wrote most of this book are: Ralph P. Boyink, supervisor of citizenship education, Edison Technical and Industrial High School, Rochester; Basil W. Conrad, former supervisor of trade and technical education, The State Education Department; and William B. Sharp, instructor of citizenship education, Burgard Vocational High School, Buffalo, N. Y.

Electric Arc Welding

By John Benjamin Austin. Cloth, 280 pp., 5¾ by 8½ in., illus., $4. American Technical Society, Chicago, Ill.

This book is written by a welding engineer whose practical experience gives him the right to claim standing as an authority in his field.

The instructional material is well written in English that is easy to understand, and the book is well illustrated.

The 13 chapters introduce the beginner to the history and scope of welding, arc-welding machines and accessories, fundamentals of arc welding, lessons in arc welding, common metals and alloys, hard facing pipe welding, arc-welding symbols, machinery and structural welding, methods of testing welds, and special metal arc processes.

Engineering Drawing: Basic Principles and Rules

By Josef V. Lombardo, Albert J. Lombardo, Lewis O. Johnson, and W. Irwin Short. Paper, 432 pp., 5½ by 8⁹⁄₁₆ in., illus., $2. Barnes & Noble, Inc., New York, N. Y.

This is a practical guide for anyone who wants to master the essentials of engineering drawing. The eleven chapters of the book introduce the student to linework and the use of instruments, geometric construction, lettering, orthographic projection, auxiliary views, sections and conventions, pictorial views, dimensioning, fasteners, working drawings, and developments and intersections.

The book also contains numerous problems for the student. It also has a chapter on American standard drafting room practice, and quite a number of tables that will prove useful to the draftsman.

Laboratory Experiments with Radioisotopes for High School Science Demonstrations

On sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. 25 cents.

This booklet which aims to assist high school science teachers who want to set up experiments with radioisotopes has been issued by the U. S. Atomic Energy Commission.

Detailing 20 experiments involving the use of

(Continued on page 37A)

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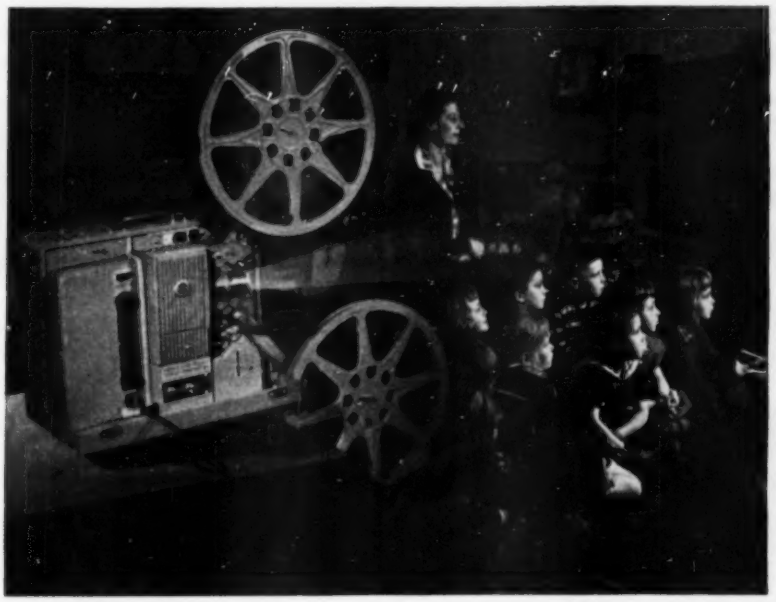

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Take a tip from the people who sell and service projectors: Kodak engineers have eliminated the biggest cause of breakdowns—over- and under-oiling! *Every model in the Kodascope Pageant line is pre-lubricated at the factory!* This exclusive 16mm. sound-projector feature keeps Pageants *out* of repair shops . . . helps you to keep *on* schedule.

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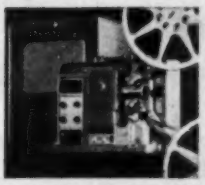

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11-10

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☐ *Pageant, Model AV-151-E* ☐ *Pageant, Model AV-151-S*
☐ *Pageant, Model AV-151-SE* ☐ *Kodascope Royal Projector*
☐ *Kodascope Analyst* ☐ *Eastman 16mm. Projector, Model 25*
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"YANKEE" Spiral Drivers & Push Drills
TEACH MOTION-SAVING

Help students do better work with fewer motions. Just a simple push with a "Yankee" Spiral Screw Driver spins the blade and drives the screw. No heavy wrist work! A flick of the shifter gives driving or drawing action, or sets spiral rigid. Pilot holes made easily with a "Yankee" Automatic Push Drill. Spring brings back handle after every push; reverse-spins drill point to clear out chips. Magazine handle holds 8 points, 1/16" to 11/64". Write for free "Yankee" Tool Book.

No. 130A Spiral Driver

No. 41 Push Drill

NORTH BROS. MFG. CO.
Philadelphia 33, Pa.

LUMBER
of
ALL KINDS

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Our Woodcraft Department Specializes in

School Shop LUMBER
Domestic & Foreign

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We Solicit Your Inquiries

COTTON-HANLON
Woodcraft Dept.
Odessa, New York

NEW PUBLICATIONS

(Continued from page 34A)

radioisotopes, the booklet also explains how nuclear radiations are detected and measured. The purpose of the experiments is to bring to students realization that rays are emitted by radioactive, or "excited," atoms, that these rays can be detected and measured only with special instruments, and that they have important uses as research tools in biology, chemistry, earth science, and physics.

Television and F-M Receiver Servicing

By Milton S. Kiver. Paper cover, 320 pp., 8⅜ by 10⅞ in., illus., $4.20. D. Van Nostrand Co., Inc., New York, N. Y.

This is the third edition of this book. The material has been brought up to date, and the present work is one third larger than any previous edition.

This encyclopedic volume includes practical information on trouble shooting, installation of and operation of antenna systems; television receivers and test equipment; R.F., Video I.F. and Video detector stages, Video amplifiers, d.c. restorers, and A.G.C. service systems; cathode-ray picture tubes; service notes on intercarrier receivers; how to use test patterns; deflection systems; television power supplies; television receiver alignment; UHF television; F-M fundamentals; commercial F-M receiver circuits; F-M receiver alignment and servicing.

The book also has an appendix in which interferences to television receivers are treated.

Elements of Cartography

By Arthur H. Robinson. Cloth, 254 pp., 7½ by 9¾ in., illus., $7. John Wiley & Sons, Inc., New York, N. Y.

A book which presents to the beginner the history of map making, and discusses how maps are drawn.

It discusses the earth and the system of co-ordinates, how projections are laid out, how to compile and prepare the map base, designing and lettering the map, using symbols, and representing terrain.

The book also contains tables of natural trigonometric functions, powers and roots, lengths of degrees of the parallel, lengths of degrees of the meridian, areas of quadrilaterals of earth's surface of 1 deg. extent in latitude and longitude, and various projection and other tables.

A Procedure for Evaluating a Local Program of Trade and Industrial Education

Paper, spiral binding, 64 pp., 6 by 9 in. Sponsored by the Joint Committee on Evaluation Procedures in Trade and Industrial Education of the National Association of State Supervisors of Trade and Industrial Education, the National Association of Local Administrators of Vocational Education and Practical Arts, and the National Association of Industrial Teacher Trainers in co-operation with the U. S. Office of Education.

This booklet discusses the purposes of evaluation and gives suggestions on evaluation procedures and reporting. Also information on overall program operation, and then shows how to evaluate administration, supervision, and individual training areas.

The appendix presents definitions of terms, and suggested reporting forms.

SHOP EQUIPMENT NEWS

(Continued from page 56A)

1822 by James Ronaldson of Philadelphia. Binny and Ronaldson came to Edinburg in 1795 and commenced typemaking in 1796. The matrices fortunately were preserved, and when they came into the possession of American Type Founders in 1892, the name Oxford was given the type. In design it is transitional between oldstyle and modern. If sufficient interest develops in Oxford, ATF may undertake preparation of duplicate matrices from the historic set in its possession.

American Type Founders, Elizabeth, N. J.

(For Convenience Circle Index Code 0911)

"YOU-TRY-IT" KIT OF PERMANENT MAGNETS

The Carboloy Department of General Electric Company have made available a "You-Try-It" kit of permanent magnets to enable educational institutions to devise their own new uses for permanent magnets.

Carboloy has designed the "You-Try-It" kits because it believes that countless additional uses for permanent magnets can be found when strong magnets are available for experimental purposes.

Two kits are available. Package No. 1 contains 48 Carboloy permanent magnets in eight styles. These magnets have up to two pounds of *pull* for each unit. Package No. 2 contains 18 larger

(Continued on next page)

The Schweizer Utility Case project is an ideal gift for the men in the family . . . and one they'll be proud to get because YOU made it.

The kit contains all you'll need—lightweight aircraft aluminum sheets—ends preformed, hinges, handle, rivets. The instructions are easy to follow and it's the same type construction used to build regular aircraft. There is time between **now** and Christmas to complete the project—a utility case, perfect for Tool Box, Tackle Box, Sports Gear Case, Picnic Box, Roller Skate Case, etc. The kit, complete, costs but $3.95 F.O.B. Elmira (weight 4½ lbs.) and makes a gift you'll be proud to give.

NOW! Also available in a more simplified form—for general shop—for lower grade levels—Complete, ready to assemble with ends, top and bottom formed, price $4.25 F.O.B. Elmira.

Sign up NOW—Order early and have time to construct the Utility Kit in time for Christmas.

SCHWEIZER

SCHWEIZER AIRCRAFT CORP.
EDUCATIONAL DIVISION
ELMIRA, N. Y.

SHOP EQUIPMENT NEWS

(Continued from previous page)

magnets, in four different styles. These have a *pull* of from 3 to 12 pounds.

Descriptive literature regarding the kit is available from *Carboloy, Department of General Electric Co., Detroit 32, Mich.*

(For Convenience Circle Index Code 0912)

NEW 6-IN. MODEL A LIMA DELUXE UTILITY GRINDER

The Lima Electric Motor Company announces immediate delivery on their new 6-inch Model A Lima Deluxe Utility Grinder. Features of this new grinder include: dynamically balanced rotors; integrally cast wheel guards; adjustable tool rests (may be tilted for angular grinding); fast-grinding, long-wearing abrasive wheels (furnished as standard equipment); heavy-duty, Off-On toggle switch in base; cast iron base (rubber mounted and drilled for permanent mounting); 7½-foot, three conductor, rubber covered cable with nonbreakable plug (U.L. approved).

For additional information and prices write *Richard R. Knierim, Sales Manager, The Lima Electric Motor Co., Lima, Ohio.*

(For Convenience Circle Index Code 0913)

BILLINGS AND SPENCER SOCKET WRENCHES

Midget size socket wrenches and parts are the latest addition to the standard line of wrenches and shop tools offered by The Billings & Spencer Company. The new addition features a ¼-in. square drive and rounds out the manufacturer's line of ¾-, ½-, and ⅜-in. square drive socket wrenches and parts.

These wrenches are designed especially for electronics technicians, carburetion specialists, electricians, and others whose work requires the use of small size assembly and adjustment tools.

They are drop-forged from Billings Vitalloy steel and conform to Billings standards for accuracy, quality, and durability. The sockets are available in six point (single hex) and eight point (double square) styles. Parts and accessories include such basics as sliding T handles, extensions, and adaptor. Also included is a small ratchet (reversible) and a wood-handled screwdriver-type spinner.

For further information write to *Billings and Spencer Co., Laurel St., Hartford, Conn.*

(For Convenience Circle Index Code 0914)

NEW OVERLAY MATERIAL FOR ART WORK

Eastman Kodak Company's Topographic Sheet, Type B, which is a translucent acetate having a high degree of dimensional stability, has been found to serve excellently as an overlay for art work. One side of the sheet is glossy like any typical acetate material, while the other has a fine tooth or ground-glass type surface which is designed to take markings or writing of any type. These markings can readily be erased or wiped off with a damp cloth if desired.

The sheet is economical because it can be used over and over again if the art work is discarded after its original use. Kodak Topographic Sheet, Type B, is offered in 40 by 50-in., and 40 by 60-in. sheets, and 20-in. by 50 and 100-ft., and 40-in. by 50 and 100-ft. rolls.

For further information write to *Eastman Kodak Co., Rochester 4, N. Y.*

(For Convenience Circle Index Code 0915)

DELTA 14-IN. DRILL PRESS

The Delta Power Tool Division, Rockwell Manufacturing Co., has produced a new 14-in. drill press which will interest teachers of industrial arts and vocational education shop subjects.

These drill presses are sturdily built; have self-aligning drives; free-floating interchangeable spindles; sturdy quill design and construction; sealed, and lubricated-for-life ball bearings.

The spindles are easily interchanged, and accuracy is increased by the fact that the work is kept close to the bearings.

The drill press is also useful in such operations as sanding, routing, shaping, mortising, and tapping.

For further information write to *The Delta Power Tool Division, Rockwell Mfg. Co., 402K No. Lexington Ave., Pittsburgh 8, Pa.*

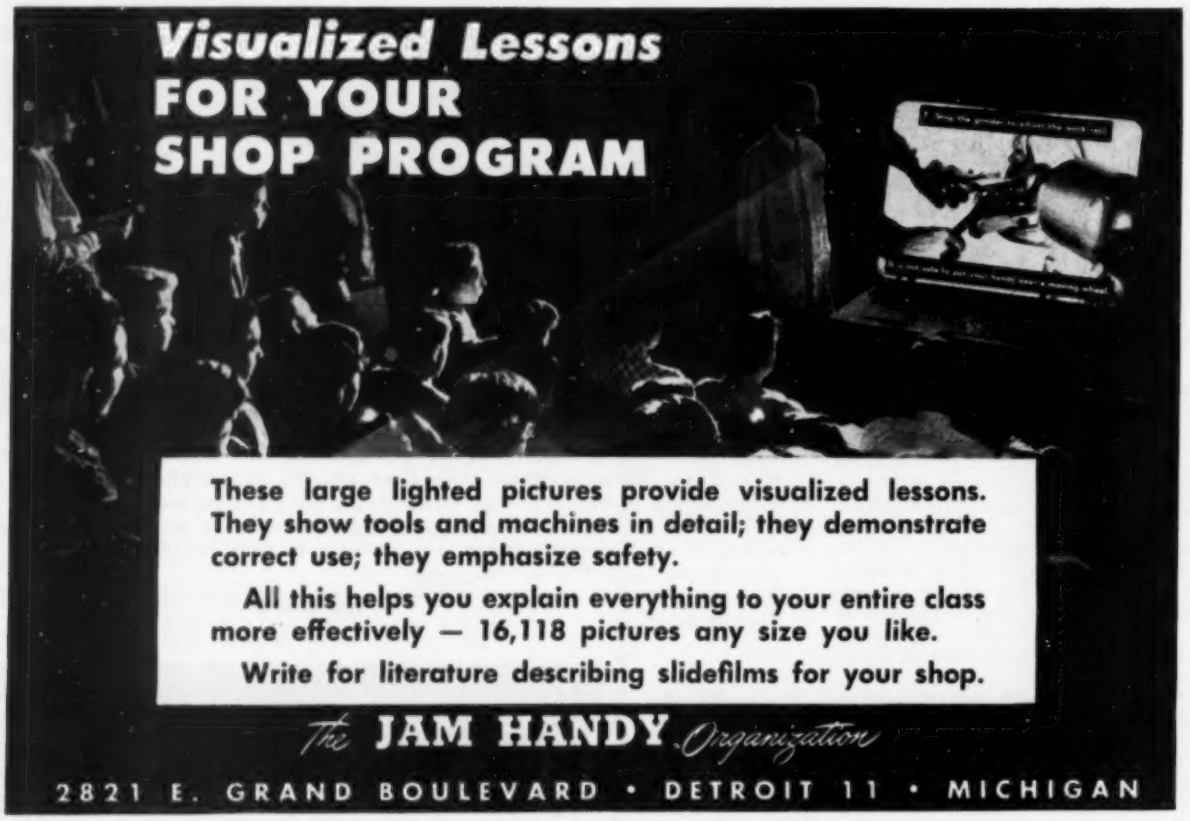
(For Convenience Circle Index Code 0916)

NEW X-ACTO DRILL-BIT LINE AND CHUCK ADAPTER

A complete line of American-made drill bits in all sizes is now offered by X-acto with a considerable saving in price.

Every user of these small size drills, Nos. 60 to 80, will also welcome the new chuck adapter which X-acto is now offering. Fine size drill bits have a tendency to break and lose control when used in the large chuck of the standard drill.

(Continued on page 40A)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FOR YOUR
SHOP PROGRAM
These large lighted pictures provide visualized lessons. They show tools and machines in detail; they demonstrate correct use; they emphasize safety.
All this helps you explain everything to your entire class more effectively — 16,118 pictures any size you like.
Write for literature describing slidefilms for your shop.
The JAM HANDY Organization
2821 E. GRAND BOULEVARD • DETROIT 11 • MICHIGAN

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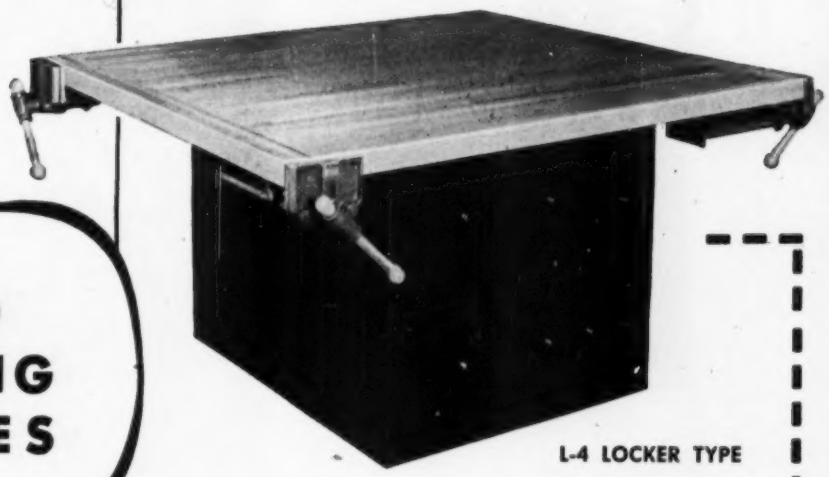
WOOD WORKING BENCHES



L-4 LOCKER TYPE

DD-4 DOUBLE DOOR

4 WORK STATIONS

The extra big size — 64" x 54" — of both these woodworking benches furnishes ample working space for four students. Each of the four corners is equipped with a strong 5CD Columbian vise.

EXTRA LONG SERVICE

Specially constructed 2¼" solid maple top provides long years of sturdy service. The vise ends of each bench are reinforced with heavy 5" battens firmly bolted for solid foundation.

SPACE SAVERS WITH PLENTY OF SPACE

Base of each bench is recessed providing maximum work area with minimum floor space. Bases are of heavy gauge metal attractively finished in olive green enamel. Interiors furnish ample storage space.

IMMEDIATE DELIVERY ON BOTH

These Woodworking Benches are the only one of their kind — made exclusively for B/G. They have proved instantaneous hits in schools adopting them. . . . A real investment in efficiency, economy, and assured long service.

THESE are America's two outstanding Woodworking Benches. Each one offers all the important features listed to the left. The only difference between them is that the L-4 Locker Type has 12 individual storage lockers, numbered and equipped for padlocks, while the DD-4 Double Door with only a horizontal dividing shelf provides more bulk storage area. Select the one that best suits your school's needs, and order it today.

With its more than 15,000 most needed, most wanted pieces of equipment, machines, and school supplies the big B/G Master Catalog is your easiest, most convenient buying guide. Use it regularly for the added savings of time and money of one source of buying. Write today for your copy.

BRODHEAD GARRETT CO.

4560 E. 71 ST. CLEVELAND 5. OHIO

"EVERYTHING IN INDUSTRIAL ART SUPPLIES"

Lowest Prices for Top Quality!
SIMONDS SI-CLONE SAWS
You get Simonds Guaranteed Quality, the buy-word in saws for more than 100 years, at no more than you would pay for regular saws . . . see price list. And Simonds Si-Clone line includes 13 types up to 12" diameter. So get the Si-Clones you need today at your local hardware or woodworking machinery dealer.
GUARANTEE: Made of SIMONDS STEEL fully guaranteed against any defect in material or workmanship.
RETAIL SELLING PRICES
For Rip, Cut-Off, Easy-Cut and Combination Saws
6" . . . $1.75
7" . . . 2.00
8" . . . 2.15
10" . . . $3.45
12" . . . 4.35
Supplied with Round or Special Shape Holes
As listed in Simonds Catalog "P"
SIMONDS SAW AND STEEL CO.
FITCHBURG, MASS.
Factory Branches in
Boston, Chicago, San Francisco and Portland, Oregon.

SHOP EQUIPMENT NEWS

(Continued from page 38A)

The new chuck adapter takes care of all these difficulties. The jaws of the new chuck close down to zero taking the finest wire drills (size 80). The chuck is inserted in the jaws of a large drill and there is then no chance of wobble or loss of control. Breakage is thereby materially reduced.

This new chuck is precision made of high carbon steel.

For further information write to *X-Acto Crescent Products Co., Inc., 440 Fourth Ave., New York 16, N. Y.*

(For Convenience Circle Index Code 0917)

Descriptive Material

JORGENSEN CLAMPS CATALOG

Adjustable Clamp Company, now in its 50th year of clamp manufacturing, has recently issued clamp catalog No. 18 describing steel spindle hand screws; wood bar cabinet clamps; steel bar clamps; band clamps; clamp hangers; flat bar, steel I bar, pipe bar with multiple disk clutches; piling clamps; spring steel and eccentric clamps; double-bar clamps; press clamps; veneer press clamps, spring clamps, miter and edge clamps, and many kinds of C and carriage clamps; quick acting C clamps, and shielded welders clamps.

The illustrations in this catalog also show how these clamps can be combined for use on many clamping jobs.

For a copy of this comprehensive catalog write to *Adjustable Clamp Co., 417 No. Ashland Ave., Chicago 22, Ill.*

(For Convenience Circle Index Code 0918)

NEW SLIDING HEAD FLOOR DRILL CATALOG

Cincinnati Lathe & Tool Co., Canedy-Otto Division, offers a new catalog, D-110, illustrating and describing the C-O Cincinnati 14-in. 3000 Sliding Head Floor Drill with exclusive tilting motor bracket for easy speed changes.

Write for a copy to *Cincinnati Lathe & Tool Co., Oakley, Cincinnati 9, Ohio.*

(For Convenience Circle Index Code 0919)

COLOR CODING ON ENGINEERS SLIDE RULES

Calculations involving trigonometric functions are performed without the usual hazard of errors by simply matching the color of the trig scale with the same color of the corresponding C, D, or CI scales of the new engineers slide rules. This mathematical compatability of the new color coding eliminates the necessity of memorizing coding functions.

The superiority of the Versalog Slide Rule is in the R_1 and R_2 scale combination which is extremely useful in computing kinetic energy, moment of inertia, and other quantities in which multiplication by the square of a number is involved.

The R_1 and R_2 combination in conjunction with the D scale provides fast and accurate calculations in radiant heat transfer in which numbers raised to the fourth power are involved.

Other refinements are the new end zone designations of the log reciprocal scales inscribed to the left of these scales and the more convenient arrangement and extension of the L L scales.

Illustrated life size in a brochure packed with facts will be mailed free on request. Ask for the VERSALOG for Professional Engineers. Write the *Frederick Post Company, Dept. V, 3650 N. Avondale Ave., Chicago 18, Ill.*

(For Convenience Circle Index Code 0920)

ALLIED RADIO'S 1954 CATALOG

Allied Radio Corporation of Chicago announces the fall release of its new 1954 catalog (No. 135), which features an unusually large selection of radio, television, and electronics parts and equipment for use in schools, classrooms, laboratories, and shops. The 1954 edition of this electronics buying guide has 268 pages, and lists over 20,000 items. It offers a wide selection of training kits, test equipment, books and diagrams, parts and tubes, and other equipment required for radio and electronic training activities.

Other items of interest to schools include latest tape, disk, and wire recorders in all price ranges, plus a wide variety of recording accessories.

The 1954 catalog is available without charge. Write to *Allied Radio Corporation, 100 N. Western Ave., Chicago 80, Ill.*

(For Convenience Circle Index Code 0921)

NEW STACOR CATALOG

The Stacor Equipment Company has just published a new catalog of steel drafting room furniture and equipment.

In it are described the filing cabinets, drawing and tracing tables, portable tracing boards, steel tripod easels, four- and five-drawer files, draftsman and tracing tables, and taborets.

For your copy, write to *Stacor Equipment Co., 768–778 East New York Ave., Brooklyn 3, N. Y.*

(For Convenience Circle Index Code 0922)

NEW MORGAN VISE CATALOG

The Morgan Vise Co. recently issued its No. 130 Catalog in which are listed their machinists' bench vises with solid and swivel bases and solid and swivel jaws. They also list combination pipe vises, sheet-metal workers' vises, brass protective caps for vise jaws, and wood workers' vises, of both solid and quick action types.

The catalog also contains a list giving the comparative numbers of vises made by other manufacturers.

For your copy, address *The Morgan Vise Co., 108–128 North Jefferson St., Chicago 6, Ill.*

(For Convenience Circle Index Code 0923)

A HELPFUL BROCHURE ON WORKING WITH PLEXIGLAS

The Cadillac Plastic Company has published an excellent brochure on "How to Work With Plexiglas."

It describes in clear and concise words how to lay out, cut, saw, punch, drill, route, shape, and turn the material. Then the finishing operations, such as filing, scraping, sanding, machine sanding, buffing, are explained.

Next is the information on plug and ring forming, blow and vacuum forming, and joining Plexiglas.

For a free copy of this helpful booklet write to *Cadillac Plastic Co., 15111 Second Ave., Detroit 3, Mich.*

(For Convenience Circle Index Code 0924)

(Continued on page 43A)

DELTA Simplicity keeps a boy's mind on the project instead of knobs and gadgets

—says Mr. Morris Taylor, Vocational Education Instructor, Jefferson High School, Charlottesville, Virginia

"Delta Power Tools are not only the safest machines to use—they are also the simplest to operate. This simplicity helps a boy to keep his mind on the project—instead of on knobs and gadgets."

At Jefferson High School, Mr. Taylor points out, students learn to get precision results through a carefully presented curriculum, capable guidance and safe, adaptable Delta Power Tools.

MACHINE KNOWLEDGE IMPORTANT TO STUDENTS

One week is spent learning each machine—by part and by function, from both use and safety standpoints. At the end of the week a test is given: all guards and covers are removed—and the pupil names and describes the parts, their uses, their adjustments, their relation to safe operation. Before a student may use any machine, he must pass this test 100%.

DELTA QUALITY MAKES THE DIFFERENCE

Mr. Taylor's reasons for recommending Delta tools are similar to those of Industrial Arts and Vocational Education instructors throughout the world. Safety, accuracy, simplicity, low maintenance costs—all have combined to make 65% of today's schools Delta-equipped.

You, too, can use Delta tools to train better craftsmen. Stop in at your Delta dealer and see the most complete line of power tools on the market. If you'd like a complete catalog, just fill in the coupon below.

FREE—this valuable magazine for shop teachers, POWER TOOL INSTRUCTOR. Four times a year . . . use the coupon.

DELTA QUALITY POWER TOOLS
Another Product of **Rockwell**

Delta Power Tool Division
ROCKWELL MANUFACTURING COMPANY
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Send me the latest Delta AB Catalog.

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Name_____

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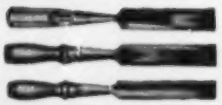
Better shopwork with fine tools by GREENLEE

CHISELS, GOUGES, TURNING TOOLS

Tough, lasting fine cutting edges for all types of woodworking. Various types of socket butt and firmer chisels with "Hardwear" green plastic or hickory handles. Outside or inside bevel socket gouges. Short and full length turning tools.



AUGER BITS, CAR BITS AND DRILLS

There's a GREENLEE for every need . . . all types of twists and heads. Accurately sized, perfect cutting edges. Line includes the famous "Greenlee 22" Solid-Center Auger Bits which come to you "Plastic Sealed" for factory-sharp edges.

EXPANSIVE BITS

Fast, easy-boring Expansive Bits with free, positive chip clearance. Specially-designed wide, open throat assures smooth, uninterrupted action. In two styles — Setfast with quick adjusting-locking feature and Plain.

SPIRAL SCREWDRIVERS AND AUTOMATIC PUSH DRILLS

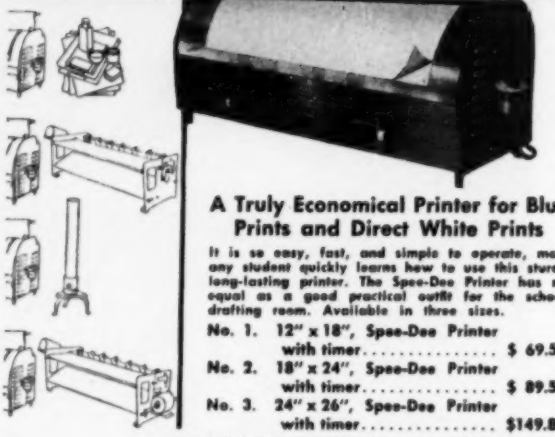
GREENLEE Spiral Screw Drivers are sturdily constructed and have special phosphor bronze drive nuts for long, hard service. Beautifully finished, three sizes. Automatic Push Drills have completely enclosed working parts and phosphor bronze drive nuts. Handle holds eight points. Chromium plated.

The GREENLEE line also includes Bit Extensions, Razor-Blade Draw Knives, Ship Augers, Electricians' Bits, Hand Benders for Tubing, Radio Chassis Punches, Knockout Tools and many other timesaving tools for the shop worker and the student.

TOOLS FOR CRAFTSMEN
GREENLEE

Free Folder H-301 with complete data on GREENLEE hand tools for the woodworker. Write Greenlee Tool Co., Division of Greenlee Bros. & Co. 2031 Twelfth Street, Rockford, Illinois. U. S. A.

AMAZING! the Time and Money Saved WITH Spee-Dee WHITEPRINT OUTFITS



A Truly Economical Printer for Blue Prints and Direct White Prints

It is so easy, fast, and simple to operate, most any student quickly learns how to use this sturdy long-lasting printer. The Spee-Dee Printer has no equal as a good practical outfit for the school drafting room. Available in three sizes.

No. 1. 12" x 18", Spee-Dee Printer with timer..... $ 69.50
No. 2. 18" x 24", Spee-Dee Printer with timer..... $ 89.50
No. 3. 24" x 26", Spee-Dee Printer with timer..... $149.81

Satisfaction guaranteed, prompt shipment, don't delay, order the model you need today.

All the Materials and Instruments Required for Drafting Departments including Blue Print and Direct Positive Print Papers. WRITE FOR PRICES.

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Students learn easier, work more safely and more accurately when their eyeglasses are SIGHT SAVER clean. Install SIGHT SAVER Cleaning Stations in your shop. Promote safety, reduce waste by making it easy for students to keep eyeglasses clean. Low cost Sight Saver Cleaning Stations are easy to install—dispense one 3" x 7" tissue at a time. Each tissue is scientifically treated with SILICONES. Thousands of industrial plants and millions of people use Sight Savers to clean, polish and protect glass lenses.

Available from*
leading Safety Supply Houses

Cat. No. 60 Black Dispenser — $2.50
Cat. No. 61 White Dispenser — $2.50
Cat. No. 62 Green Dispenser — $2.50
Cat. No. 65 Refill Packet contains 800 tissues — $1.45

*** Write Dept. IS11 for name of Safety Supply Houses in your area**

DOW CORNING CORPORATION
Midland Michigan
DOW CORNING SILICONES

DESCRIPTIVE MATERIAL

(Continued from page 40A)

FILMS FOR SCHOOL AND INDUSTRY

United World Films, Inc., has issued the 1953–54 catalog of some 2700, 16mm. and 35mm. U. S. Government films for school and industry. Both motion picture and filmstrips are listed.

The contents of the catalog are listed under the following headings: U. S. Department of Agriculture, Air Force, Army, Coast Guard, Office of Education, Office of Inter-American Affairs, Navy, Public Health Service, Department of State, Veteran Administration, Office of War Information, other U. S. agencies, and Federal Civil Defense Administration.

These films are for sale only.

For a copy of this catalog or for other information relative to these films, write to *United World Films, 1445 Park Ave., New York 29, N. Y.*

(For Convenience Circle Index Code 0925)

A NEW HANDY AND HARMAN BOOKLET ON SILVERSMITHING

Handy & Harman have just published another instructional booklet *Contemporary Silversmithing — the Stretching Method.* The ancient technique of stretching heavy silver into seamless forms is a method particularly well suited to the development of contemporary design of irregular or free shape. The booklet explains the method through illustrated step-by-step directions for making a triangular sauce boat.

Copies of the booklet may be obtained from the Craft Service Department, *Handy & Harman, 82 Fulton Street, New York 38, N. Y.*

(For Convenience Circle Index Code 0926)

CONTOUR POLISHING WITH ABRASIVE BELTS

Behr-Manning Division of Norton Company have reprinted an article from the *American Machinist* on "Abrasive Belts Speed Production Contour Polishing and Grinding."

For a copy of this interesting and informative brochure, write to *Behr-Manning, Troy, N. Y.*

(For Convenience Circle Index Code 0927)

CHEMICALS FROM COAL

Union Carbide and Carbon Corporation have published a booklet in colors describing the plant which they erected in West Virginia.

In this plant they transform powdered coal into dozens of chemicals.

For a copy of this interesting booklet, write to *Union Carbide and Carbon Corp., 30 East 42nd St., New York 17, N. Y.*

(For Convenience Circle Index Code 0928)

NEW BOICE-CRANE COMPANY CATALOG

A new 52-page catalog, on power tools for cutting, shaping, drilling, and finishing wood, metal, fiber, and plastics, has just been published by Boice-Crane Company, Toledo, Ohio.

Intermediate capacity band saws, contour saws, band filers, drill presses, tool grinders, jig saws, jointers, lathes, planers, shapers, saw jointers and belt, drum and spindle sanders are fully described and illustrated.

A copy of this new catalog, No. 52, will be sent free to anyone addressing his request to *Boice-Crane Co., 932 Central Ave., Toledo 6, Ohio.*

(For Convenience Circle Index Code 0929)

BUSINESS & PERSONAL NEWS

CHANGE OF ADDRESS

Victor Animatograph Corporation, Davenport, Iowa, U.S.A., announces change of address of its New York office to 551 Fifth Avenue, New York 36, N. Y. The New York office is under the supervision of Horace O. Jones, vice-president.

NEW MANAGER OF SALES TRAINING AT A. B. DICK CO.

Harold N. Cheney has been appointed manager of sales training at the A. B. Dick Co., Chicago, Ill.

AMERICAN TYPE FOUNDERS NAME RESEARCH CHIEF

American Type Founders, Elizabeth, N. J., has named Dr. John O. Taylor director of research.

Mr. Taylor, a physicist of international reputation, formerly headed the graphic arts consulting organization bearing his name. He has been on a consulting basis with the Elizabeth printing equipment concern for a year.

PERSONNEL CHANGES IN THE INTERNATIONAL TEXTBOOK CO.

Robert E. Wilson, formerly West Coast college representative, has been appointed manager of

(Continued on next page)

PAXTON LUMBER

to meet every need in your school shop!

A COMPLETE SELECTION

You will find that PAXTON has a complete line of quality hardwood and softwood lumber and plywood, as well as other material, to perfectly fulfill the requirements of each individual project.

GREATER ECONOMY

Since PAXTON products are of a constant high quality, waste and spoilage are reduced to a minimum.

MORE SATISFACTION

Naturally your students will derive more satisfaction from their efforts to create attractive articles in wood, working with quality lumber — PAXTON LUMBER. You and they will see the difference!

Write to the yard nearest you for a free catalog!

▶ SEE OUR EXHIBIT • AVA CONVENTION • BOOTH NO. 40 ◀

FRANK PAXTON LUMBER CO.

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Des Moines, Iowa - - - - - - - - - - - - - - - P.O. Box 683
Fort Worth, Texas - - - - - - - - - - - - - - - P.O. Box 1225
Kansas City, Missouri - - - - - - - 6311 St. John Avenue

Ready to use
when the glues start
with no waste
Because Franklin Glue is ready to use right out of the can or tube there is no waste from over-mixing or spoilage. Pour unused glue back into can when through. Foolproof for beginners. Will not stain wood . . . it's "the choice of fine craftsmen everywhere."
Genuine Hide
and the extra strength of GENUINE HIDE GLUE
GENEROUS SIZE
SAMPLE TUBE FREE
when request is made on official school letterhead.
AVAILABLE IN 7 SIZES
GALLON
QUART
PINT
½ PINT
¼ PINT
2 OZ.
TUBE
EVERTITE
RESIN GLUE
READY TO USE
We also make the best
WHITE GLUE
EVERTITE is a liquid resin glue, ready to use. Available in tubes, 2 oz., ¼ pt., ½ pt., pt., qt. and gallon sizes.
SAMPLE ON REQUEST
you can use tubes on shop cards—
You can now supply each student with a tube of Franklin Glue for a project. Include the cost of glue in your rotating fund supported by shop cards instead of paying it as part of regular budget.
The Franklin Glue Co.
131 W. Chestnut St.,
Columbus 15, Ohio

BUSINESS & PERSONAL NEWS

(Continued from previous page)

International Textbook Company's college division.

David R. Lippincott, college, school, and trade representative in the Middle Atlantic States, assumes the assistant managerships of the college and school divisions. Robert H. Schulenberger continues as manager of Laurel Publishers, ITC's trade division.

William W. Scranton, former manager and vice-president of the International Textbook Company, has resigned his position but will continue as a director of the company.

WATKINS APPOINTED GENERAL SALES MANAGER

L. A. Watkins has been appointed General Sales Manager of Ditto, Inc., Chicago, Ill., manufacturer of duplicating machines and supplies.

Formerly vice-president and managing director of Ditto of Canada, Ltd., Mr. Watkins brings to his new post 16 years of experience with Ditto, including 4 years as a salesman and 6 years as a branch manager.

STANLEY WEST COAST SALES REPRESENTATIVE APPOINTED

Thomas R. Harper has been appointed educational sales representative on the West Coast for Stanley Tools.

Mr. Harper, who will call on schools and colleges in the western states, is a native of Missouri. He was graduated from the Northeast Missouri State Teachers College in Kirksville, Mo., and for three years was an instructor of industrial arts in Missouri schools.

During the war he served with the Army Ordnance Training Center at the Proving Grounds in Aberdeen, Md. He has completed an intensive factory training course at Stanley Tools in New Britain, and is now calling on West Coast schools. Mr. and Mrs. Harper will make their home in California.

THEODORE H. BRAIN APPOINTED MANAGER OF MECHANICAL EQUIPMENT

Theodore H. Brain became associated with Ditto, Inc., Chicago, when he was appointed manager of the Mechanical Equipment Division on July 1, 1952.

His new responsibilities also include Manufacturing and Industrial Engineering Departments, Production Control, Purchasing Fabrication, Assembly and Inspection.

AIR REDUCTION SALES COMPANY NAMES NEW MANAGERS

The Air Reduction Sales Company announced the appointment of A. S. Blodget, Jr. as manager of their Pittsburgh district.

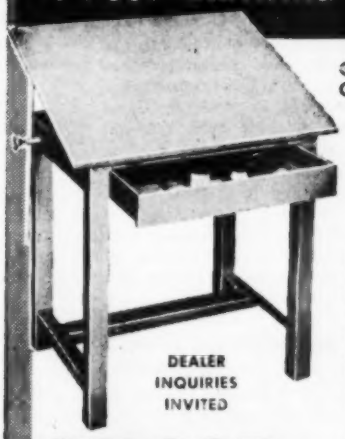
E. S. Twining, Jr., formerly assistant sales manager of the company's Philadelphia district, succeeds Mr. Blodget as manager of the Boston district.

The changes were made following the death of S. D. Edsall, former manager of the Pittsburgh district

(Continued on page 46A)

make one permanent* investment.
. . . forget about replacements.

STACOR
4-POST DRAWING TABLE



DEALER INQUIRIES INVITED

LIFETIME STEEL CONSTRUCTION

Rigid welded steel construction assures amazing durability under the heaviest use • table top adjusts to comfortable working angle • selected soft wood top • hard baked grey hammertone enamel finish • 8 board sizes, 2 heights.

WRITE TODAY FOR CATALOG

STACOR EQUIPMENT COMPANY
Manufacturers of Lifetime Steel Blue Print Filing Cabinets, Drafting Tables, Tracing Tables, Etc.
479 TROY AVE., BROOKLYN 3, NEW YORK

Hiz MAJIZTY
MUST HAVE THE BEST

Because the future is his domain we must give his present endeavor firm support. At the Sjöström work bench he will be inspired, because *it is*, in itself, a lesson in craftsmanship.

V 6-D
Elementary bench 42" long x 22" wide x 26" high. There are others.
Ask for data sheet C-532

SJÖSTRÖM WORK BENCHES
1712 NORTH 10TH STREET, PHILADELPHIA 22, PA.

See this FAST FOLEY TRIO at AVA

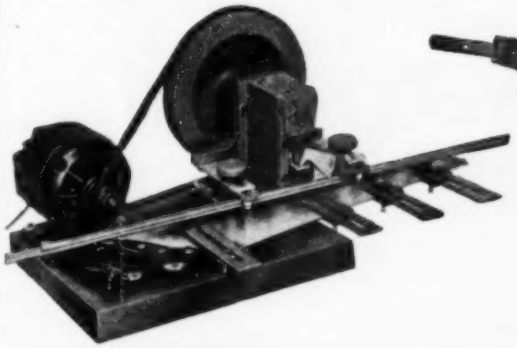
BOOTH 117
CHICAGO, NOV. 22-27

EXCELLENT STUDENT TRAINING
Train your students to use Foley machines. They will do better work with Foley sharpened saws. Foley equipment is widely used by hundreds of schools, colleges, industries, Army, Navy, Air Force, etc. See it in operation at Booth 117.

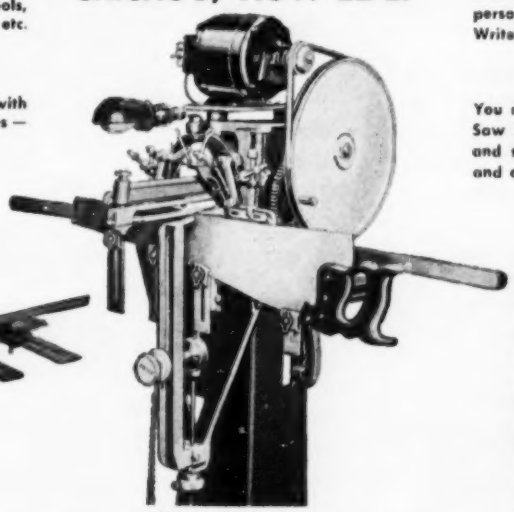
FASTER SAW RECONDITIONING
You can sharpen 4 to 6 hand saws per hour with these three Foley Automatic power machines — Saw Filer, Retoother, Setter.

VOCATIONAL REHABILITATION
Foley Saw Sharpening Machines have proven their value for making physically handicapped persons self-supporting in their own business. Write us for full details.

30-DAY TRIAL OFFER
You may have the privilege of using a Foley Saw Filer in your own shop for 30 days, — and see for yourself its training advantages and operating economies. Ask us about it.



FOLEY RETOOTHER
Cuts new teeth in old saws (either straight or crowned edge) in one run through machine.



FOLEY SAW FILER
Files hand, band and cross-cut circular saws with machine accuracy. The saw is clamped in carrier which feeds it through all 3 machines for retoothing, filing, setting.

FOLEY SETTER
For both hand and band saws. Sets teeth on both sides in ONE run with perfect machine accuracy.

FOLEY MANUFACTURING COMPANY • 3318 N. E. 5th St., Minneapolis 18, Minn.

BUSINESS & PERSONAL NEWS

(Continued from page 44A)

NEW LE BLOND SALES AND SERVICE REPRESENTATIVE

The R. K. LeBlond Machine Tool Company of Cincinnati announces the appointment of Sales and Service Machinery Company, Suite 201, 3818 Chestnut Street, Philadelphia 4, Pa., as sales representative in Eastern Pennsylvania, Southern New Jersey, Maryland, District of Columbia, and Delaware.

Staffed with experienced machine tool men well known in the Philadelphia area, the new distributor offers the complete line of LeBlond lathes and lathe attachments, as well as other leading makes of machine tools.

APPOINTED DISTRICT SALES MANAGER

The following seven new District Sales Managers have been added by A. B. Dick Co., 5700 West Touhy Ave., Chicago 31, Ill.: Darwin P. Acheson, Ray B. Allen, William H. Bushing, Vincent P. Lynch, John Sleer, Bob A. Wilson, and Merle Williams.

H. L. INGRAM, JR., APPOINTED TECHNICAL DEVELOPMENT DEPARTMENT MANAGER

H. L. Ingram, Jr., Airco's special representative, Washington, D. C., has been appointed manager of the technical development department of Air Reduction Sales Company. Included in the technical development department are four sections — aircomatic, metallurgical, technical market development, and process development laboratory.

Air Reduction Sales Company, a division of Air Reduction Company, Inc., 60 East 42nd St., New York 17, N. Y., is a producer of oxygen, acetylene, and welding and cutting equipment.

A. C. BROWN, JR., APPOINTED GENERAL SALES MANAGER

A. C. Brown, Jr., regional manager of the Air Reduction Sales Company, has been appointed general sales manager.

Mr. Brown, who has been located in Pittsburgh, will have his headquarters at 60 East 42nd St., New York, N. Y.

APPOINTED SALES EDUCATION DIRECTOR

Homer B. Smith has been appointed Sales Education Director of DITTO, Inc., Chicago manufacturer of liquid and gelatin duplicating machines and supplies, at 2243 W. Harrison St.

In this newly created position, he will be responsible for the preparation of sales educational material for DITTO's own sales force, for the various DITTO dealers throughout the country, and for the vast school field, the majority of which now depends upon DITTO equipment for classroom, extracurricular and administrative copy work.

T. E. BERRY APPOINTED DISTRICT MANAGER

Thomas E. Berry has been named to cover the New York territory for DeWalt, Inc.

Mr. Berry, a resident of North White Plains, N. Y., has studied at Yale and Columbia Universities. In addition he has taken the Mechanical Maintenance course given by the U. S. Army and Radio Corporation of America's course in salesmanship.

Prior to joining the DeWalt firm, he was regional sales manager for a large manufacturer of welding materials, did sales promotion work for the Scovill Manufacturing Company of Waterbury, Conn., and served as personal aide to Lennox R. Lohr, president of the National Broadcasting Company.

DEWALT'S NEW DISTRICT MANAGER FOR PITTSBURGH

H. J. Van Buskirk has been appointed district manager of the Pittsburgh, Pa., area for DeWalt, Inc., subsidiary of American Machine & Foundry Company, and manufacturers of a complete line of radial arm power cutting tools.

Mr. Van Buskirk, who is 41 years old, is a native of Cohoes, N. Y. He is a graduate of Cohoes High School and of the Troy Business College of Troy, N. Y., where he majored in Business Administration.

In addition to the immediate Pittsburgh area, he will cover a territory extending from Erie southward to the Virginia border, and from Sunbury westward to the Ohio border for the DeWalt firm.

EIGENBERGER NAMED DISTRICT MANAGER

Jerome H. Eigenberger has been appointed district manager for the Milwaukee area, by DeWalt, Inc., subsidiary of American Machine and Foundry Co., Lancaster, Pa. Mr. Eigenberger's territory will also include much of Illinois and other sections of Wisconsin.

IMMEDIATE DELIVERY!

KILN-DRIED! SOFT-TEXTURED!

SCHOOL SHOP LUMBER

Check list of species on right. Many other special School Shop items are available. We specialize in School Shop lumber service and can make prompt delivery from our large inventory of "ready-to-ship" kiln-dried lumber.

Wherever possible, we ship via commercial trucking lines for quick, dependable, safe, clean delivery.

No Advance in Prices as Shown in Catalog No. 53

MAIL US YOUR ORDER TODAY!

HARDWOOD CORPORATION OF AMERICA

EDUCATIONAL LUMBER DIVISION

ASHEVILLE, NORTH CAROLINA

Heyer has IT!
only $185 complete!
1 Visible fluid supply—32-oz. tank—no pump!
2 Adjustable pressure control—longer runs.
3 Positive master clamp—easy to operate!
4 Automatic centering of print—new raise-and-lower control.
5 Eye-easy reset counter—just where you want it.
6 Large capacity rotary feed—150 copies per minute!
7 Perfect registration—prints any size up to 9" x 15".
New! CONQUEROR SPIRIT DUPLICATOR
with ALL the features!
PRICED FAR LOWER THAN ANY COMPARABLE MACHINE . . .
ASK YOUR HEYER MAN, OR WRITE FOR COMPLETE INFORMATION.
THE Heyer CORPORATION • Established 1900
1850 South Kostner Avenue • Chicago 23, Illinois
New York, 3 Los Angeles, 36

Plan LOW-COST, HIGH-INTEREST SHOP PROJECTS WITH CADILLAC PLASTICS' SPECIALLY PRICED

PLASTIC ASSORTMENTS FOR SCHOOL SHOP USE

PLEXIGLAS • CEMENTS • DYES

No other materials offer students so wide a range of things to make. Plastics can be cut, drilled, machined, formed and shaped. And if you are cost conscious about the materials used in your school shop—here is the way to save MORE on all your plastics needs. These assortments of pre-cut sizes, shapes and colors, suitable for all projects, are priced at a fraction of the cost for plastics cut to order. Send for special price list. Today!

Write for two FREE booklets: "How to Work With Plastics" and handy "Conversion Table."

Buy NOW for The NEXT Term!

Special Introductory Offer

COLORED PLEXIGLAS

Assortment includes translucent, opaque and transparent reds, blues, greens, greys, whites and others.

10 LBS. $9.50

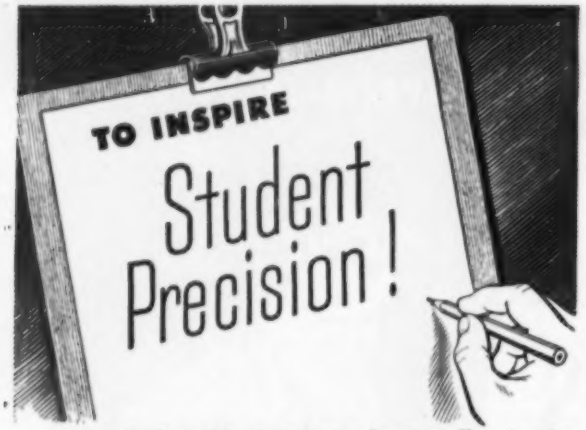
All new, flat, paper masked Plexiglas in the best colors. Finest quality in mixed sizes and thicknesses. Size 6" x 12" and larger.

20 Lbs.	$17.00
40 Lbs.	30.00
100 Lbs.	70.00

15111 Second Bldv., Detroit 3, Michigan
Chicago Warehouse: 727 W. Lake Street., Chicago, Illinois

Cadillac Plastic Co.

AMERICA'S LARGEST PLASTICS SUPPLY HOUSE



Preferred by instructors because they inspire students to new achievements . . . WESTON instruments also are the choice of practical administrators because their ruggedness and year after year dependability make their cost remarkably low! Ask for bulletin listing all instruments.

WESTON Electrical Instrument Corporation,
614 Frelinghuysen Avenue, Newark

For Advanced Requirements MODEL 622

Ultra sensitive instruments of the double pivoted type requiring no leveling when used in horizontal position. Combine high accuracy and a 6.1 inch scale . . . ideal for precise measurements of potential and current at very low energy levels. Available as d-c voltmeters, millivoltmeters, milliammeters and microammeters; electrolysis volt-millivoltmeters and high resistance voltmeters—also as a-c rectifier type instruments and as thermocouple ammeters, milliammeters and voltmeters.

For Electrical Machinery Labs MODEL 633

A clamp-on volt-ammeter built to Weston standards of safety, accuracy and dependability. Five full scale a-c current ranges of 1000/250/100/25/10 amperes with range overlap. Three self-contained a-c voltage ranges of 700/350/175 volts—insulated for 750 volts. Has convenient 6 position switch easily operated by thumb—adjustable pointer stop facilitates measuring starting current of motors.

WESTON
WESTON *Instruments*

Harper

TRUE PORCELAIN KILNS

Versatile Firing Ranges To 2500° F.

You'll want one of these Harper Electric kilns for your school Ceramic Department. Their wide firing range to 2500° F. allows students and instructors to experiment with all types of low temperature and high temperature Ceramic ware, including *true hard* porcelain.

Advantages for your school are many; Harper Studio Kilns:

- are clean, quiet and safe to operate in any classroom
- are sturdily constructed to withstand maximum use
- require little maintenance
- have a versatile firing range to 2500° F.
- are economical to operate and maintain.

SK-151416 Harper Studio Kiln with 1½" cu. ft. capacity.

Let us send you Bulletin 1246 describing Harper Studio kilns being used in many leading school and universities throughout America.

HARPER ELECTRIC FURNACE CORP.
Dept. 3
39 River Street Buffalo 2, N. Y.

FOR TEACHING
BASIC ELECTRICITY
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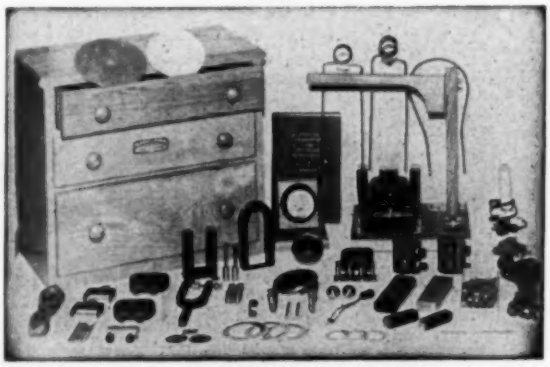


CROW MODEL 100G DEMONSTRATION KIT

TYPICAL COMMENTS OF USERS

"Really a fine thing for teaching electricity."
"With it I can demonstrate what would otherwise require much talking, in a few minutes."
"The Manual is as excellent as the equipment."

Our Model 100-G Kit was designed for teaching basic or elementary electricity. Ideal for lecture demonstrations before small groups or for student experiment purposes.

Furnished complete with illustrated text-manual.

WRITE FOR FREE ILLUSTRATED BULLETIN.

UNIVERSAL SCIENTIFIC COMPANY, INC.
BOX 336G VINCENNES, INDIANA

AUTO-MECHANICS

TEXTBOOKS *for your modern school shop by that foremost automobile authority*

Ray F. Kuns

Perhaps there is no other man so well known and so highly regarded in the field of automotive trade training as Ray F. Kuns. His basic books, written with the experience garnered in 20 years as vocational teacher, supervisor, and principal, are standards in the field and the choice of up-to-date instructors everywhere.

Announcing . . .

The 1953, Completely Revised Edition of Volume II

AUTOMOTIVE SERVICE

This thorough revision of the previous book brings it current with the very newest of automotive developments. More than 400 new illustrations and the new text covers the latest in engines carburetors, pistons, valves, cylinders and crankshaft forms, camshafts, oil pumps, radiators, gears — every part of the power plant plus cooling, oiling, fuel, ignition, and electrical systems. It is now more than ever a source of complete training information on the maintenance and repair of all modern cars.

Volume I

AUTOMOTIVE SERVICE

Provides the basic and specific information needed by the mechanic to repair and maintain specific parts of the car: frames, wheel suspension, steering and ride control, transmissions, clutches, universals and front and rear wheel systems, and brakes. Part one of the book covers the theory and part two, the practice. Simple and well-organized text material and a great many illustrations provide an easy learning approach. $3.50

AUTOMOTIVE ESSENTIALS

A modern basic textbook that equips high school students to select, operate, and repair automobiles intelligently. Its tested plan of organization treats the car as a unit, then breaks it into minor parts and components until each essential parts is superbly illustrated and explained so that even the non-mechanical mind understands it thoroughly. $3.36

AUTOMATIC TRANSMISSIONS

More than 500 photographs and drawings illustrate this basic text which covers the theory, maintenance, servicing, testing, tools, and repairing of all automatic transmissions being used in modern automobiles. Every type is included, with one specific make of transmission used to represent all transmissions of a similar construction and design. $4.00

AUTO MECHANICS

A series of six books offering a complete course in the theory of auto-mechanics repair and maintenance.

FRAME AND BODY MAINTENANCE

Latest in the group, it covers entirely the practice of auto body and frame work from the simplest of ding and dent work to complete repairing of automobiles. $2.50

Book One — The Engine	$1.25
Book Two — Cooling, Lubrication, and Fuel System	1.25
Book Three — Automotive Electricity	1.25
Book Four — The Power Flow	1.25
Book Five — Chasis Units	1.25

AUTO-MECHANICS STANDARD-PRACTICE JOB SHEETS

Bostwick-Yergey

Practical job experience in auto mechanics is the aim of these job sheets, prepared by men skilled in the field through work and teaching. Representative jobs from the four books are:

- **To replace a generator**
- **To rebuild and replace a water pump**
- **To adjust a clutch petal**
- **To overhaul a differential assembly**

The sheets are in four books with from 23 to 38 jobs in each. Every job sheet has a list of tools required, special instructions, reference texts and exact procedure with specific questions.

48 cents each

Examination copies of these texts will be sent for 30 days' study!

THE BRUCE PUBLISHING CO.
711 Bruce Bldg. Milwaukee 1, Wis.

SHOP EQUIPMENT NEWS

STANLEY TOOLS RELEASES BIT GAUGE

The new No. 47 Bit Gauge that has just been released by Stanley Tools is fully adjustable, will not mar surface of work, and has no parts to lose. Clamp is quickly attached to the shank of any auger bit 5/16 to 15/16 sizes. The spring is then adjusted for correct depth of hole desired. An extra turn of clamping nut locks all parts in place. When the predetermined depth of the hole

is reached, tip of spring contacts surface of the wood. If boring continues, spring bends but won't mar surface.

The gauge is particularly useful for school shops as there are no loose parts to be lost. Screw on clamping nut is upset so that the nut cannot work free. Spring cannot be removed from holder.

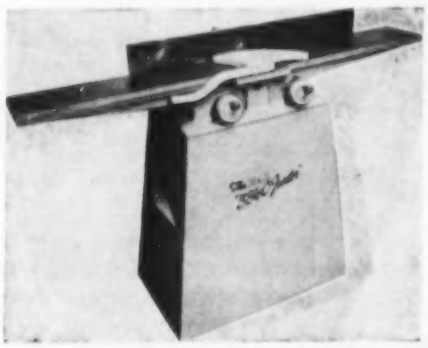
For further information contact *E. C. Benfield, Stanley Tools, New Britain, Conn.*

(For Convenience Circle Index Code 0901)

HESTON & ANDERSON NEW 6-IN. JOINTER

Heston & Anderson has announced that its new "5860" 6-in. jointer is now ready for distribution.

The big table, 60 in. over-all, with its 37 by 4-in. fence, now rests on a sturdy tapered stand. Large hand wheels with turning knobs, controlling the setting of each table, are handily located at the front of the jointer.



Heston and Anderson 6-in. Jointer

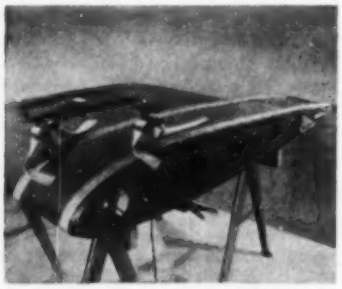
A balanced three-knife head, 2⅞ in. in diameter, operates at 6000 r.p.m. (18,000 cuts). Only heavy-duty, dustproof life-sealed bearings are used. Rabbeting capacity is ⅝ in. with a rabbeting arm support 8½ in. long, extending 3 in. from the bed.

For further information, write to *Heston & Anderson*, division of the *St. Paul Foundry & Mfg. Co., St. Paul, Minn.*

(For Convenience Circle Index Code 0902)

NEW STYLE NO. 62 "JORGENSEN" BAND CLAMPS

The new Style No. 62 *Jorgensen* Band Clamp, is designed for holding or clamping round or irregularly shaped objects and assemblies, such as furniture frames, aircraft assemblies, tanks and columns, for gluing, riveting, welding, and similar operations. The strong, canvas band (steel band is optional) is 2 in. wide, encircles the object to be clamped, and is drawn tight by the screw fixture.



No. 62 Jorgensen Band Clamp

The band is quickly adjustable to the work, from either end, and is held securely under load by self-locking cams up to the strength of the band itself — approximately 2800-lb. load. Cam extensions provide for quick and easy release.

The screw fixture has no loose parts, and is relatively light in weight; the complete clamp and band weighs only about 6 lbs. Canvas band is always supplied unless "steel band" is specified — steel band should be used only on round shapes. Stock sizes are from 10-ft. to 30-ft. band length capacity.

Complete specifications and details are available from the manufacturer, the *Adjustable Clamp Company, 424 No. Ashland Ave., Chicago 22, Ill.*

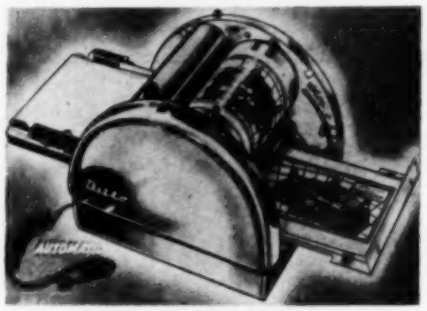
(For Convenience Circle Index Code 0903)

NEW DITTO ELECTRIC DUPLICATOR

Ditto, Inc., has the new Ditto D-11 Electric Direct Process Duplicator.

The new D-11 is a rugged machine which can be used for hand feed, if desired, through the use of a simple tripping operating handle.

The D-11 employs the famous Ditto direct process duplicating principle. There are no stencils to cut, no type to set, no mats to sensitize. It will reproduce two copies per second of anything typed, written, drawn, or printed through duplicating carbon, in as many as five colors in one operation. Copies can be made on any weight



Ditto Electric Automatic Duplicator

paper from 16 lb. to heavy card stock and in any size up to 8½ by 14 in.

A disappearing receiving tray streamlines the machine. Reversible feed tray facilitates handling of long and short sheets. Quick shift paper guides provide instant adjustments for various size forms. Swinging feed rollers make refilling paper tray an easy job. Stainless steel parts guard against corrosion.

For further information write to *Ditto, Inc., 2247 W. Harrison St., Chicago 12, Ill.*

(For Convenience Circle Index Code 0904)

YATES-AMERICAN MACHINE COMPANY ANNOUNCES NEW TILTING ARBOR VARIETY SAW

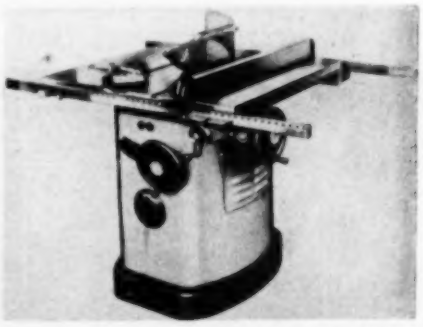
Yates-American Machine Company has announced production of a new 10-in. Tilting Arbor Variety Saw, with a rip fence that is always in perfect alignment at all times.

The new saw, Model G-110, incorporates all of the essential features desired in modern circular saw construction. It is sturdy, has a shock-insulated frame, and a heavily ribbed table. The miter gauge operates on either side of the saw blade and is self-supporting when extended beyond the table. The fence rail extensions do not affect the accuracy of fence setting.

The saw has a micrometer fence adjustment (to sixty-fourths) on a large, easily read dial.

The new G-110 has a maximum thickness cut of 3⅛ in. Distance from the front edge of the table to the front of the blade (when set for maximum thickness) is 13⅞ in. Capacity cut is 25 in. to the right and 19 in. to the left. With

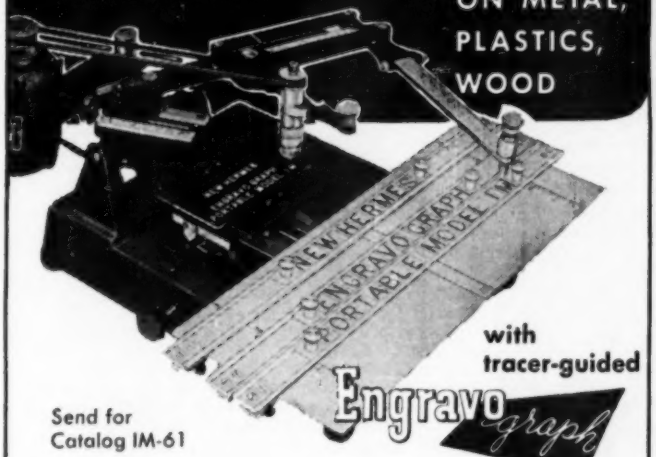
(Continued on page 52A)



New 10-in. Tilting Arbor Saw

TEACH *Engraving*

ON METAL, PLASTICS, WOOD



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World's Largest Manufacturer of Portable Engraving Machines

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McKnight Publications

"28 TABLE LAMP PROJECTS"

#4 — *By H. A. Menke.* The 28 lamps include both modern and traditional designs. The working drawings and instructions for making each lamp are clear and easily followed. A photograph of each lamp when finished with appropriate shade adds to the value of the book. $2.50

"PROJECTS in GENERAL METALWORK"

#29 — *By M. J. Ruley.* Thirty-five projects in sheet, bench and band iron work. Blueprint and job sheet for each project. $2.00

"PROJECTS in WOODWORK"

#3 — New Edition by *Douglass and Roberts.* Includes 33 new projects of contemporary design. Total of 120 working projects for beginners as well as experienced. Working drawings for each project. Projects have been carefully checked for best design and construction. Many practical helps on best way to proceed. $3.25

"PROJECTS in ELECTRICITY"

#12 — *By Collings.* Twenty-one inexpensive projects. Simplified construction through use of drawings and step-by-step instructions. $1.20

"MACHINE SHOP PROJECTS"

#32 — *By Knight.* Twenty-five usable projects give practice in most machine tool operations. In blueprint form. $1.20

"CARVING ANIMAL CARICATURES"

#90 — *By Waltner.* A practical presentation of techniques of wood carving, devoted mainly to animal caricatures. Contains 23 interesting objects with specific instructions for carving and finishing each. $1.50

"CARVED BILLFOLD DESIGNS"

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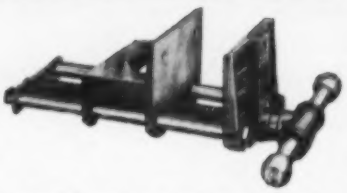

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SHOP EQUIPMENT NEWS

(Continued from page 50A)

fence rail extensions, capacity to the right is increased to a full 48 in.

For further information write to *Yates-American Machine Co., Beloit, Wis.*

(For Convenience Circle Index Code 0905)

UTICA NO. 92 LOCKING WRENCH

The first major improvement in adjustable wrenches in many years is now in production by the Utica Drop Forge & Tool Corporation. It is called the Utica No. 92 Locking Wrench. It works like an ordinary adjustable wrench, but the jaws can be locked rigid at any setting. In addition, it acts as a vise wrench exerting a 100-lb. grip on the bolt or machine component on which it is used.

No. 92 Locking Wrench
Utica Drop Forge

Though it looks much like a standard Utica adjustable wrench there is one big difference — it has a lever about three inches long which snaps over the handle. This lever, which operates on the knurl, controls the jaw locking and unlocking action.

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A VISE WRENCH

When using it as a vise wrench, adjust the jaws lightly on the work like the usual wrench. Then the locking lever is moved out until the "clutch" mechanism engages the knurl. About ¼-inch

(Continued on page 54A)

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SHOP EQUIPMENT NEWS

(Continued from page 52A)

movement does this. A slight clockwise turn of the lever squeezes the jaws together vise-tight. Actually, a push with a single finger exerts 100 lb. of vise pressure. Jaws lock so tight they won't slip even on rounded nuts or bolts. When the job is finished, a reverse movement of the locking lever releases the vise lock.

The new Utica No. 92 is available in three sizes — 8 in., 10 in., and 12 in.

For further information, write to *Utica Drop Forge and Tool Corp., Utica 4, N. Y.*

(For Convenience Circle Index Code 0906)

NEW LOCK-UP BENCH

A new lock-up bench for use in the composing room or as an imposing or lock-up table for small presses has been announced by The Challenge Machinery Company.

The bench has a 28 by 48-in. cast-iron table top, 2 in. thick, a tool shelf, steel drawer with lock, and a shelf and footrest below. The top shelf can be used for quoins, mallets, planers, etc. The drawer is convenient for storing quoins, lock-up materials, and tools. The shelf below provides additional storage space.

New Lock-Up Bench

The 2-inch. table is heavily ribbed and has solid corners to keep the surface firm. Rabbet at front edge of table is just the right depth and width for the end of a regulation galley. The bench is equipped with leveling screws on two full-length braces under the table. The legs are solidly braced. It is shipped knocked down.

For further information write to *The Challenge Machinery Co., Grand Haven, Mich.*

(For Convenience Circle Index Code 0907)

SOUTH BEND MODEL KITS FOR PLANNING YOUR NEW SHOP

South Bend Lathe Works have devised a Model Planning Kit described in Bulletin 5301 which provides a means for shop officials to avoid costly guesswork when they are making new shop plans.

This four-page, two-color bulletin outlines the opportunities which three-dimensions offer over the old method of 2-D blueprints. It illustrates models of all South Bend machine tools to a scale of ¼ in. = 1 ft. The pictures in the bulletin show how *layout engineering* will help the planner see in miniature what his layout will be when the machinery is installed. He will find in Bulletin 5301 a way to better planning. The complete kit can be obtained on a free-loan basis with only transportation costs paid by the borrower.

Request your copy of Bulletin 5301 from *South Bend Lathe Works, South Bend 22, Ind.*

(For Convenience Circle Index Code 0908)

(Continued on page 56A)

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SHOP EQUIPMENT NEWS

(Continued from page 54A)

NEW MILLERS FALLS MULTIPURPOSE SANDER-POLISHER

The latest addition to the high-performance utility electric tools of the Millers Falls Company of Greenfield, Mass., is the new No. 966 sander-polisher — a most versatile finishing and multi-purpose portable power tool.

Basically, a powerful disk sander and polisher, it can also be used with many rotary accessories such as drills, grinding wheels, etc. Equipped with a special orbital attachment for fine finishing, the No. 966 has acquired a wide range of usefulness for cleaning, finishing, and polishing wood, metal, plastic, etc. For rotary operation, it is furnished complete with 6-in. flexible rubber pad, 6-in. lamb's-wool bonnet, and three 6-in. aluminum oxide sanding disks in assorted grits. For fine finishing, the orbital attachment is used with ⅓ of any standard 9 by 11-in. abrasive sheet.

Additional accessories and supplies include a ¼-in. Jacobs key chuck, ½-in. wheel arbor, bench stand, 6-in. buffing wheel, 4-in. grinding wheel, 4-in. wire brush wheel, 2¾-in. cup wire brush, paint stirrer, and special formula power auto polish.

For further information write to *Millers Falls Co., Greenfield, Mass.*

(For Convenience Circle Index Code 0909)

STANDARD PRESSES FOR WET AND DRY OFFSET

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For further information write to *American Type Founders, Elizabeth, N. J.*

(For Convenience Circle Index Code 0910)

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(Continued on page 37A)

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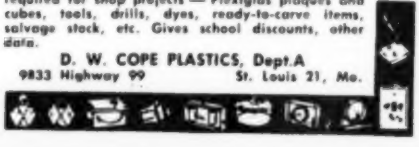

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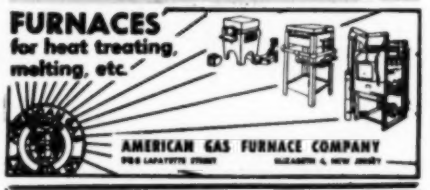

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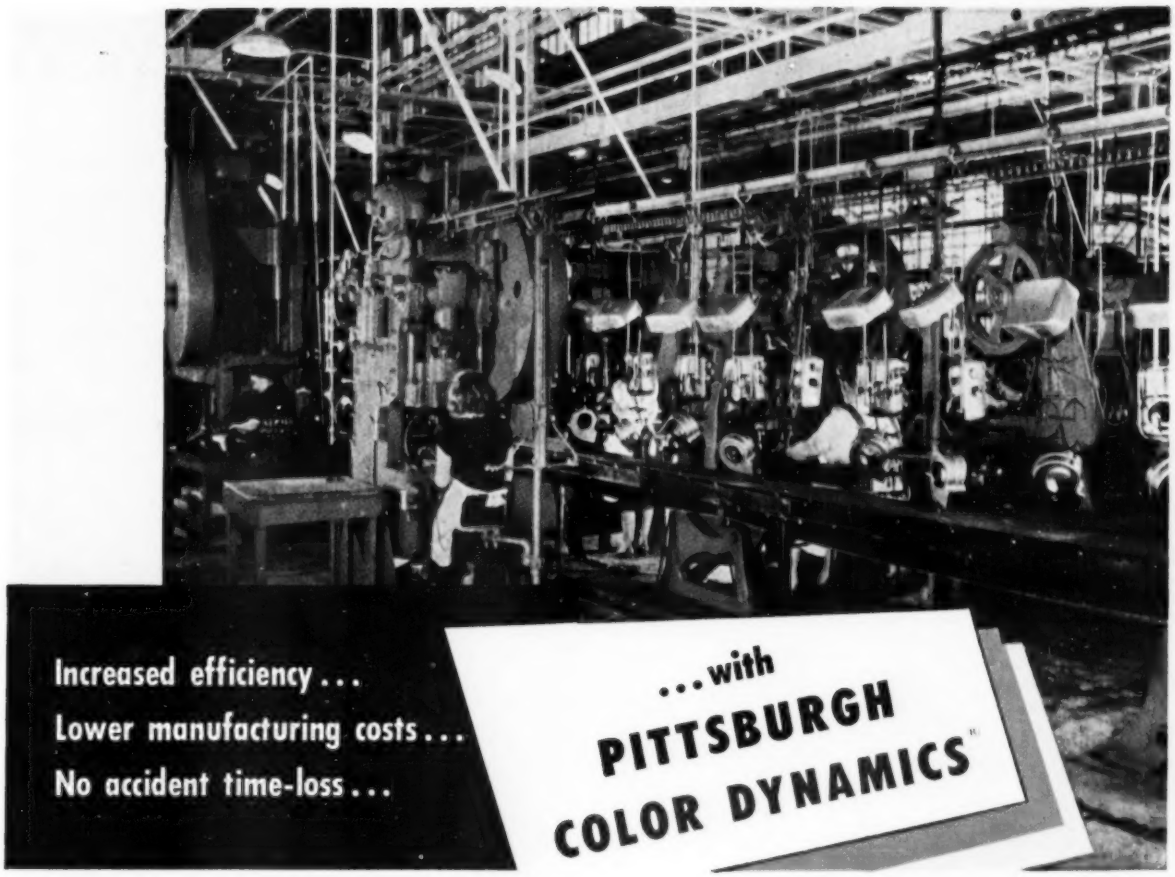

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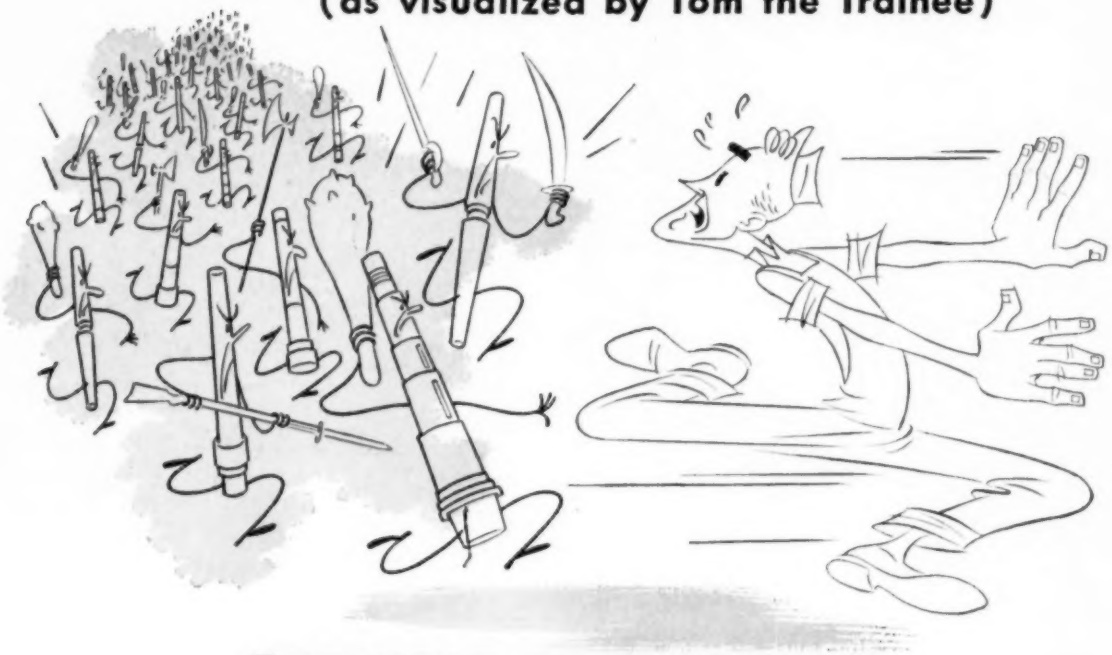

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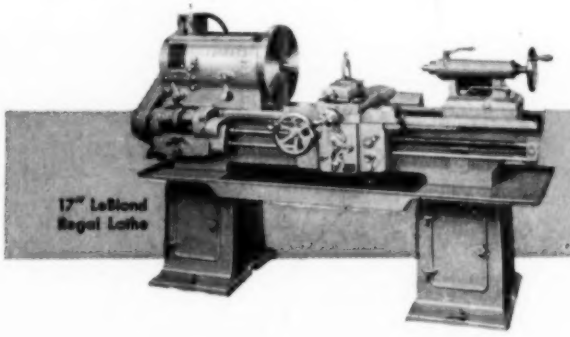

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